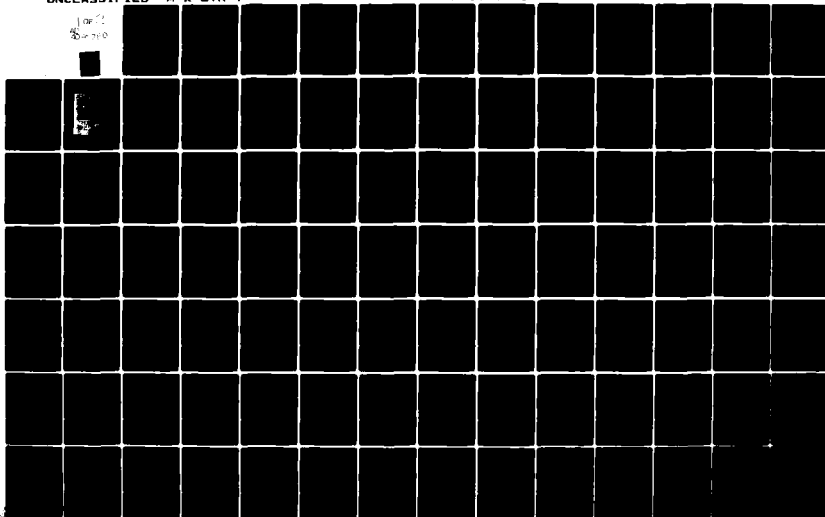


AD-A095 780

HENNINGSON DURHAM AND RICHARDSON SANTA BARBARA CA F/G 16/1
M-X ENVIRONMENTAL TECHNICAL REPORT. ALTERNATIVE POTENTIAL OPERA--ETC(U)
DEC 80 F04704-78-C-0029
UNCLASSIFIED M-X-ETR-7 AFSC-TR-81-22 NL

1 of 2
50-100



13

174

AD A 095780

M-X

ENVIRONMENTAL
TECHNICAL REPORT

DTIC
1991
A

ETR 7
OB: DELTA

DBG FILE COPY

81 3 03 116

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

19 REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AFSC-TR-81-22	2. GOVT ACCESSION NO. AD-A093780	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) M-X Environmental Technical Report-Alternative Potential Operating Base Locations, Delta.		5. TYPE OF REPORT & PERIOD COVERED Final Report.
		6. PERFORMING ORG. REPORT NUMBER MX ETR 7
7. AUTHOR(s)	13	8. CONTRACT OR GRANT NUMBER(s) F04704-78-C-0029
9. PERFORMING ORGANIZATION NAME AND ADDRESS Henningson, Durham and Richardson Santa Barbara CA 93010		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 64312F
11. CONTROLLING OFFICE NAME AND ADDRESS 14 M-X-ETR-7 1212 //		12. REPORT DATE 22 December 1980
		13. NUMBER OF PAGES 123
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Unclassified/Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) MX Delta, Utah Siting Analysis Utah Environmental Report		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The area of analysis (AOA) for the Delta operating base includes Millard County, Utah. The AOA is located in the central section of the designated region of influence (ROI) where Delta and Fillmore are the major settlements. This analysis details important environmental characteristics of Delta and vicinity and the proposed base site, respectively with additional discussion of construction and operation of an operating base.		

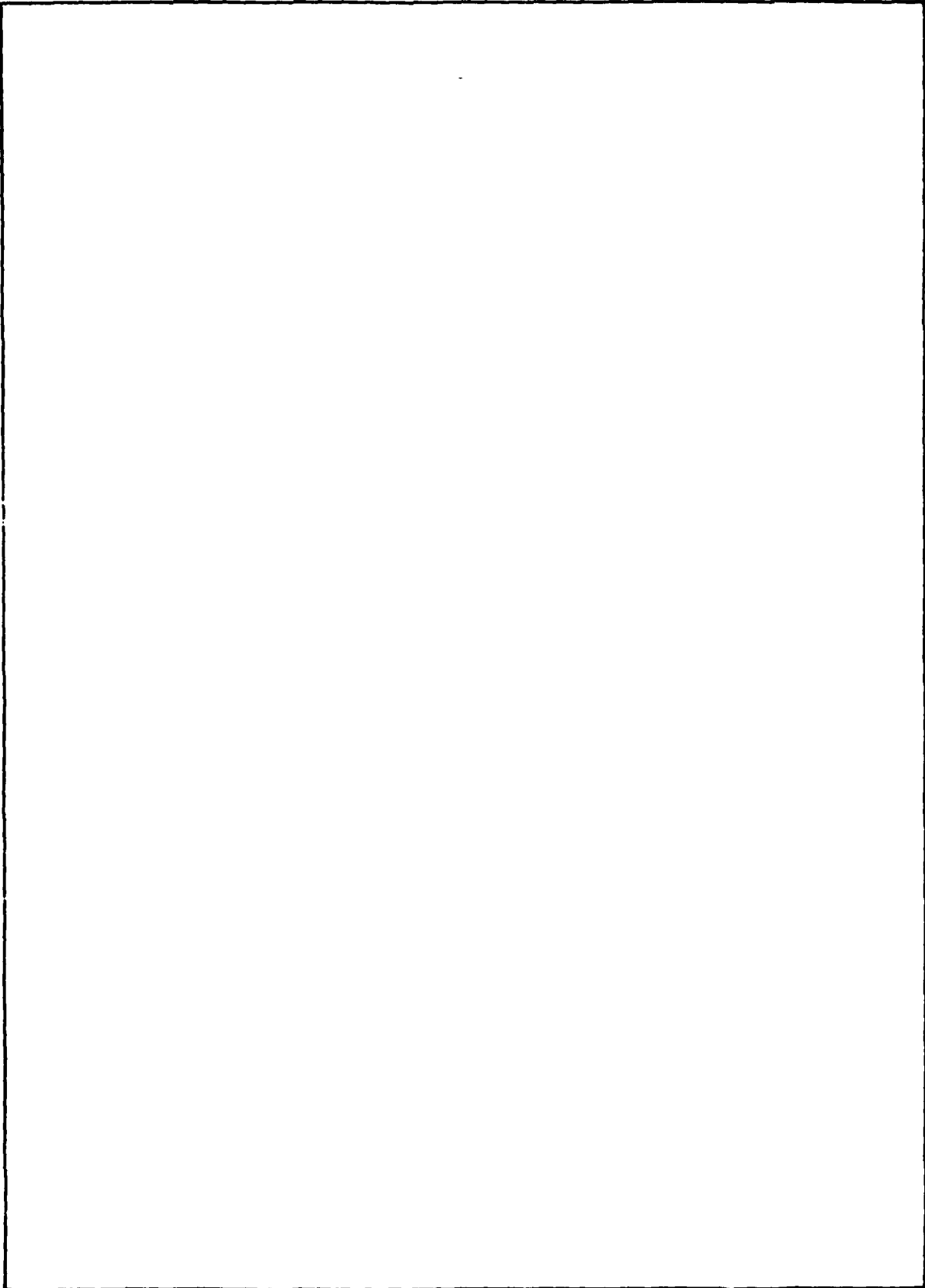
DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified 4 19

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)



SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

INSTRUCTIONS FOR PREPARATION OF REPORT DOCUMENTATION PAGE

RESPONSIBILITY. The controlling DoD office will be responsible for completion of the Report Documentation Page, DD Form 1473, in all technical reports prepared by or for DoD organizations.

CLASSIFICATION. Since this Report Documentation Page, DD Form 1473, is used in preparing announcements, bibliographies, and data banks, it should be unclassified if possible. If a classification is required, identify the classified items on the page by the appropriate symbol.

COMPLETION GUIDE

General. Make Blocks 1, 4, 5, 6, 7, 11, 13, 15, and 16 agree with the corresponding information on the report cover. Leave Blocks 2 and 3 blank.

Block 1. Report Number. Enter the unique alphanumeric report number shown on the cover.

Block 2. Government Accession No. Leave Blank. This space is for use by the Defense Documentation Center.

Block 3. Recipient's Catalog Number. Leave blank. This space is for the use of the report recipient to assist in future retrieval of the document.

Block 4. Title and Subtitle. Enter the title in all capital letters exactly as it appears on the publication. Titles should be unclassified whenever possible. Write out the English equivalent for Greek letters and mathematical symbols in the title (see "Abstracting Scientific and Technical Reports of Defense-sponsored RDT/E," AD-667 000). If the report has a subtitle, this subtitle should follow the main title, be separated by a comma or semicolon if appropriate, and be initially capitalized. If a publication has a title in a foreign language, translate the title into English and follow the English translation with the title in the original language. Make every effort to simplify the title before publication.

Block 5. Type of Report and Period Covered. Indicate here whether report is interim, final, etc., and, if applicable, inclusive dates of period covered, such as the life of a contract covered in a final contractor report.

Block 6. Performing Organization Report Number. Only numbers other than the official report number shown in Block 1, such as series numbers for in-house reports or a contractor/grantee number assigned by him, will be placed in this space. If no such numbers are used, leave this space blank.

Block 7. Author(s). Include corresponding information from the report cover. Give the name(s) of the author(s) in conventional order (for example, John R. Doe or, if author prefers, J. Robert Doe). In addition, list the affiliation of an author if it differs from that of the performing organization.

Block 8. Contract or Grant Number(s). For a contractor or grantee report, enter the complete contract or grant number(s) under which the work reported was accomplished. Leave blank in in-house reports.

Block 9. Performing Organization Name and Address. For in-house reports enter the name and address, including office symbol, of the performing activity. For contractor or grantee reports enter the name and address of the contractor or grantee who prepared the report and identify the appropriate corporate division, school, laboratory, etc., of the author. List city, state, and ZIP Code.

Block 10. Program Element, Project, Task Area, and Work Unit Numbers. Enter here the number code from the applicable Department of Defense form, such as the DD Form 1498, "Research and Technology Work Unit Summary" or the DD Form 1634, "Research and Development Planning Summary," which identifies the program element, project, task area, and work unit or equivalent under which the work was authorized.

Block 11. Controlling Office Name and Address. Enter the full, official name and address, including office symbol, of the controlling office. (Equates to funding sponsoring agency. For definition see DoD Directive 5200.20, "Distribution Statements on Technical Documents.")

Block 12. Report Date. Enter here the day, month, and year or month and year as shown on the cover.

Block 13. Number of Pages. Enter the total number of pages.

Block 14. Monitoring Agency Name and Address (if different from Controlling Office). For use when the controlling or funding office does not directly administer a project, contract, or grant, but delegates the administrative responsibility to another organization.

Blocks 15 & 15a. Security Classification of the Report: Declassification/Downgrading Schedule of the Report. Enter in 15 the highest classification of the report. If appropriate, enter in 15a the declassification/downgrading schedule of the report, using the abbreviations for declassification/downgrading schedules listed in paragraph 4-207 of DoD 5200.1-R.

Block 16. Distribution Statement of the Report. Insert here the applicable distribution statement of the report from DoD Directive 5200.20, "Distribution Statements on Technical Documents."

Block 17. Distribution Statement (of the abstract entered in Block 20, if different from the distribution statement of the report). Insert here the applicable distribution statement of the abstract from DoD Directive 5200.20, "Distribution Statements on Technical Documents."

Block 18. Supplementary Notes. Enter information not included elsewhere but useful, such as: Prepared in cooperation with ... Translation of (or by) ... Presented at conference of ... To be published in ...

Block 19. Key Words. Select terms or short phrases that identify the principal subjects covered in the report, and are sufficiently specific and precise to be used as index entries for cataloging, conforming to standard terminology. The DoD "Thesaurus of Engineering and Scientific Terms" (TEST), AD-672 000, can be helpful.

Block 20. Abstract. The abstract should be a brief (not to exceed 200 words) factual summary of the most significant information contained in the report. If possible, the abstract of a classified report should be unclassified and the abstract to an unclassified report should consist of publicly releasable information. If the report contains a significant bibliography or literature survey, mention it here. For information on preparing abstracts see "Abstracting Scientific and Technical Reports of Defense-Sponsored RDT&E," AD-667 000.

**ALTERNATIVE POTENTIAL
OPERATING BASE LOCATIONS:
DELTA**

Prepared for

**United States Air Force
Ballistic Missile Office
Norton Air Force Base
California**

By

**HDR Sciences
Santa Barbara, California**

22 December 1980

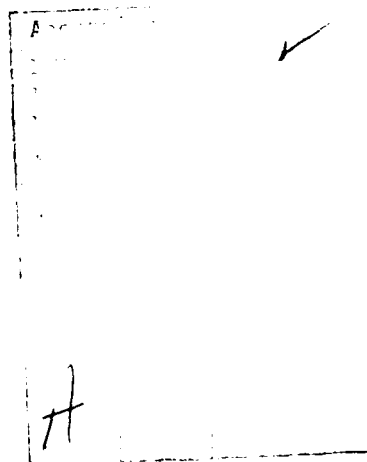
TABLE OF CONTENTS

	<u>PAGE</u>
1.0 Delta and Vicinity Community Environment	1
1.1 Human Environment	1
1.1.1 Economic Activity	1
1.1.2 Public Finance	1
1.1.3 Population and Communities	7
1.1.4 Land Use	13
1.1.5 Land Ownership	28
1.1.6 Housing	28
1.1.7 Community Infrastructure	28
1.1.8 Quality of Life	35
1.1.9 Energy	40
1.1.10 Traffic and Transportation	40
1.1.11 Native Americans	40
1.1.12 Archaeological and Historic Resources	42
1.1.13 Other Projects	43
1.2 Natural Environment	46
1.2.1 Biological Resources	46
1.2.2 Surface Water	50
1.2.3 Groundwater	52
1.2.4 Soils and Slopes	53
1.2.5 Air Quality	54
2.0 Environmental Consequences for the Operating Base Vicinity	56
2.1 Human Environment	56
2.1.1 Effects on Employment (Jobs) and Labor Force	56
2.1.2 Effects on Income and Earnings	60
2.1.3 Effects on Public Finance	60
2.1.4 Effects on Population and Communities	64
2.1.5 Effects on Land Use	74
2.1.6 Effects on Land Ownership	82
2.1.7 Effects on Housing	82
2.1.8 Effects on Community Infrastructure	87
2.1.9 Effects on Quality of Life	96
2.1.10 Effects on Energy	101
2.1.11 Effects on Transportation	102
2.1.12 Effects on Native Americans	102
2.1.13 Effects on Archaeological and Historical Resources	104
2.2 Natural Environment	105
2.2.1 Effects on Vegetation	105
2.2.2 Effects on Wildlife	105

	<u>PAGE</u>
2.2.3 Effects on Aquatic Species	106
2.2.4 Effects on Protected Species	106
2.2.5 Effects on Wilderness and Significant Natural Areas	109
2.2.6 Effects on Surface Water	109
2.2.7 Effects on Groundwater Resources	109
2.2.8 Effects on Air Quality	111
2.2.9 Effects on Mining and Geology	112

LIST OF FIGURES

Figure		Page
1.0-1	Location of Delta OB in the Nevada/Utah Region of Influence (ROI)	2
1.1.3-1	Historic and projected baseline population in Millard County	20
1.1.4-1	Rural land use/land ownership in the vicinity of Delta, Utah	26
1.1.10-1	Existing traffic volumes in the vicinity of Delta	41
1.1.13-1	Population projections, Millard County, 1980-1994	47
1.2.1-1	Candidate OB site with respect to major vegetation types	48
2.1.5-1	Assumed area of influence around the proposed Delta OB site	81
2.1.6-1	Land ownership and operating base in the vicinity of Delta, Utah	83
2.1.9-1	Potential changes in the quality of life profiles of Millard County, Utah	99
2.1.11-1	Projected traffic volumes in the vicinity of Delta, assuming second operating base	103
2.2.4-1	Delta suitability envelope vs. rare plants	107
2.2.5-1	Delta suitability envelope vs. significant natural areas	110
2.2.8-1	PAL model results	113



LIST OF TABLES

Table	Page
1.1.1-1 Total employment and percent share by major economic sectors for selected counties in Utah, 1977	3
1.1.1-2 Employment growth by sector for selected counties in Utah, 1967 to 1977	4
1.1.1-3 Earnings by economic sector for selected counties in Utah, 1967 to 1977	5
1.1.1-4 Per capita income and earnings shares by economic sector for selected counties in Utah, 1977	6
1.1.2-1 Valuation, indebtedness limitation and reserve bonding capacities, 1979	8
1.1.2-2 General fund revenues and expenditures, Millard County, Utah, selected years	9
1.1.2-3 General fund revenues and expenditures, City of Delta, Utah, fiscal year 1978-79	10
1.1.2-4 Summary of expenditures, by fund, Millard County School District, 1977-78	11
1.1.2-5 Summary of revenues, all funds, Millard County School District, fiscal year 1977-78	12
1.1.3-1 Selected population characteristics in the Nevada/Utah impact region	14
1.1.3-2 Population change and components of change, 1960 to 1970 and estimated 1970 to 1976, by county, in the Nevada/Utah impact region	16
1.1.3-3 Projected population by county, assuming trend growth and assuming growth related to energy and mineral development projects in some counties, Nevada/Utah impact region, 1980-1994	18
1.1.3-4 Projected annual compound growth rates by county, assuming trend growth and high growth associated with mineral development projects, Nevada/Utah impact region	21
1.1.4-1 Inventory of plans and ordinances - Millard and Juab counties (1979)	22
1.1.4-2 Land use in Millard and Juab counties	24

Table	Page
1.1.4-3 Land Ownership - Millard County, 1978	25
1.1.7-1 Summary of educational statistics for study area locations	30
1.1.7-2 Education facilities in Millard County	31
1.1.7-3 Health services and facilities in study area locations	32
1.1.7-4 Police protection characteristics in study area locations	33
1.1.7-5 Fire protection characteristics in study area locations	34
1.1.7-6 Selected recreation facilities data, 1979	36
1.1.8-1 Quality of life indicators, Millard County	37
1.1.12-1 Location of known site types by topographic zones in the Sevier Desert basin	44
1.1.13-1 Projected employment by major industrial sector, Millard County, 1980-1994	45
1.2.1-1 Potential wilderness and significant natural areas within a 50-mile radius of the Delta site	51
1.2.5-1 Total emissions and emission density levels of alternative potential OB locations	55
2.1.1-1 M-X-related system employment by place of employment, in Millard County	57
2.1.1-2 Total civilian M-X-related employment, available resident labor force, and net civilian labor force impact by place of residence for Beaver: Proposed Action, Low Baseline	59
2.1.1-3 Total civilian M-X-related employment, available resident labor force, and net civilian labor force impact by place of residence for Millard County	59
2.1.2-1 M-X-related earnings, in millions of FY1980 dollars, in Millard County; Alternative 2	61
2.1.3-1 Local Government Revenues, Expenditures, and Net Impacts (thousands FY 1980 \$): Low Baseline, Millard County	62
2.1.3-2 School District Revenues, Expenditures, and Net Impacts (thousands FY 1980 \$): Low Baseline, Millard County	65
2.1.3-3 M-X-related capital expenditure requirements (thousands FY 1980 \$): Low Baseline, Millard County	67

Table		Page
2.1.3-4	Local Government Revenues, Expenditures, and Net Impacts (thousands FY 1980 \$): High Baseline, Millard County	68
2.1.3-5	School District Revenues, Expenditures, and New Impacts (thousands FY 1980 \$): High Baseline, Millard County	70
2.1.3-6	M-X-related capital expenditure requirements (thousands FY 1980 \$): High Baseline, Millard County	72
2.1.4-1	Projected baseline population, M-X-related population change, and cumulative population change related to M-X and other projects, by Alternative, in Millard County	73
2.1.4-2	Projected cumulative population in-migration by project-related employment category, by alternative, in Millard County, assuming Trend Baseline	75
2.1.4-3	Projected cumulative population in-migration by place of residence, by alternative, in Millard County, assuming Trend Baseline	76
2.1.5-1	Cumulative M-X-related land requirements (acres) by use category, by alternative, in Millard County assuming Trend Baseline	77
2.1.5-2	M-X urban land requirements and impacts, Millard County	79
2.1.6-1	Land ownership at potential operating base facilities at Delta, Utah	84
2.1.7-1	Cumulative M-X-related housing unit requirements in local communities by housing type, by alternative, in Millard County, assuming Trend Baseline	85
2.1.7-2	Cumulative M-X-related housing unit requirements in local communities by housing type, by alternative, in Millard County, assuming High Baseline	86
2.1.7-3	Cumulative baseline housing unit requirements in local communities, and cumulative total housing unit requirements related to M-X and other projects, by alternative, in Millard County	88
2.1.8-1	Projected baseline and M-X induced school enrollments by grade level, by alternative, in Millard County: assuming Trend Baseline	89

Table		Page
2.1.8-2	Projected baseline and M-X induced teacher requirements by grade level, by alternative, in Millard County: assuming Trend Baseline	91
2.1.8-3	Projected baseline and M-X-related health services and hospital bed requirements, in Millard County: assuming Trend Baseline	92
2.1.8-4	Projected baseline and M-X-related health services and hospital bed requirements, in Millard County: assuming Trend Baseline	94
2.1.8-5	Projected baseline and M-X-related requirements for law enforcement personnel, by alternative, in Millard County: assuming Trend Baseline	95
2.1.8-6	Projected M-X-related land requirements for parks and playgrounds, by alternative, in Millard County: assuming Trend Baseline	97
2.1.8-7	Projected baseline and M-X-related land requirements (acres) for solid waste disposal, by alternative, in Millard County: assuming Trend Baseline	98
2.2.8-1	Delta, Utah, traffic-related concentrations: 1-hour averages in $\mu\text{g}/\text{m}^3$ (ppm) 50 m from edge of roadway	114

1.0 DELTA AND VICINITY COMMUNITY ENVIRONMENT

The area of analysis (AOA) for the Delta operating base includes Millard County. The AOA is located in the central section of the designated region of influence (ROI) as shown in Figure 1.0-1 where Delta and Fillmore are the major settlements. This section and Section 1.2 detail important environmental characteristics of Delta and vicinity and the proposed base site, respectively with additional discussion of construction and operation of an OB discussed in Section 1.2.

1.1 HUMAN ENVIRONMENT

ECONOMIC ACTIVITY (1.1.1)

Employment

Tables 1.1.1-1 and 1.1.1-2 highlight detailed employment characteristics of Millard County. The former table indicates the relative dependence of the county's economy on only two sectors--agriculture, comprising 31 percent of total employment in 1977, and government, the source of 21 percent of 1977 county employment. Other sectors, notably manufacturing and services, traditionally dominate a well-balanced economic base; in Millard County, both of these sectors had percent shares of total employment equal to only half of the state average and one-third of the 1977 national average employment share.

Table 1.1.1-2 presents 10-year employment growth figures and indicates that Millard County has grown at just about the same rate as the nation over the 1967-1977 period. Most sectors experienced relatively little change except for manufacturing which increased by about 14 percent per year.

Income and Earnings

Total earnings have exhibited little growth over the 1967-1977 period. Table 1.1.1-3 highlights Millard County earnings by major industrial sector relative to other counties in Utah. It indicates that the county's 1977 total earnings of \$22.3 million were less than two-fifths of one percent of the state's total. Further, Millard County's earnings growth was 20 percent less than that for Utah over the 1967-1977 period. Disaggregating earnings by industry, the same pattern of negligible growth is observed except in the manufacturing sector where earnings nearly tripled over the 10-year period.

Table 1.1.1-4 highlights per capita income and earnings shares by major industry in Millard County. The county's 1977 per capita income of \$3,978 was roughly 67 percent that of Utah's and 57 percent of U.S. per capita income. By industrial source, government comprised 25 percent and agriculture 21 percent of 1977 total county earnings. Services, manufacturing and construction industries had earnings levels well below state and national averages, due mainly to relatively small employment levels in these sectors.

PUBLIC FINANCE (1.1.2)

Principal governmental units in the Delta and vicinity area include the County of Millard, the City of Delta and the Millard County School District. The area's tax

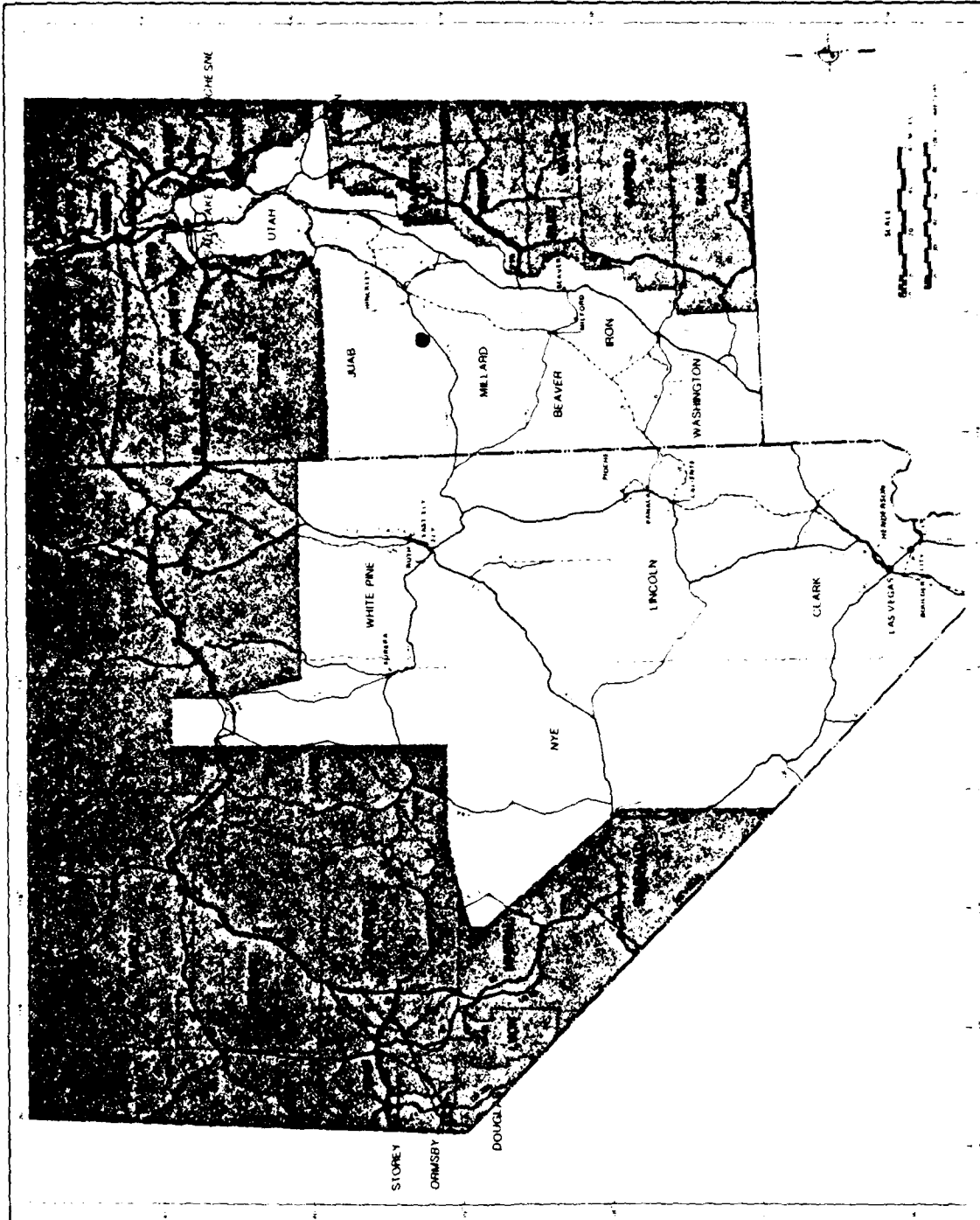


Figure 1.0-1. Delta OB location in the Nevada/Utah region of influence.

Table 1.1.1-1. Total employment and percent share by major economic sectors for selected counties in Utah, 1977.

COUNTY	TOTAL EMPLOYMENT 1977	PERCENT OF TOTAL STATE EMPLOYMENT	AGRICULTURE SHARE (%)	MINING SHARE (%)	CONSTRUCTION SHARE (%)	MANUFACTURE SHARE (%)	SERVICES SHARE (%)	GOVERNMENT SHARE (%)
Beaver	1,726	0.3	18.2	1.3	2.6	8.6	(D)	20.4
Davis	50,061	9.1	2.2	0.1	4.6	9.3	9.2	51.1
Iron	6,517	1.2	9.4	3.9	5.0	6.2	9.8	26.7
Juab	2,150	0.4	13.2	(D)	(D)	25.8	7.3	20.7
Millard	3,416	0.6	30.9	1.8	1.2	6.8	6.4	21.4
Salt Lake	272,043	49.4	0.5	2.3	5.9	13.9	16.8	17.3
Tooele	10,959	2.0	3.1	0.6	10.0	9.7	4.5	57.1
Utah	59,393	10.8	4.6	7.0	6.1	20.0	20.6	16.6
Washington	6,365	1.2	6.9	0.4	7.0	7.9	11.9	21.4
Weber	49,011	8.9	2.3	0.1	4.8	11.4	14.5	30.2
Utah State Total	550,214		3.7	2.7	5.8	13.5	14.7	23.2
U.S.	97,898,874		4.2	4.2	4.0	20.1	17.4	18.2

(D) Not shown to avoid disclosure of confidential data.

Source: Bureau of Economic Analysis, April 1979.

Table 1.1.1-2. Employment growth by sector for selected counties in Utah, 1967 to 1977.

COUNTY	TOTAL		AGRICULTURE		MINING		CONSTRUCTION		MANUFACTURING		SERVICES		GOVERNMENT	
	1967	1977	Δ ¹	1967	1977	Δ	1967	1977	Δ	1967	1977	Δ	1967	1977
BOONVILLE	1,625	1,720	96	340	312	-28	(D)	45	(D)	(D)	120	(D)	201	352
BRADY	4,031	50,061	46,030	1,231	1,084	-147	710	2,323	12.6	3,122	4,662	4.1	26,429	26,560
CLARK	4,433	6,517	2,084	671	610	-61	176	327	6.4	270	405	4.1	1,154	1,743
COCONINO	2,116	2,150	34	343	283	-60	(D)	(D)	(D)	436	554	2.4	482	445
COCHISE	2,041	3,416	1,375	1,093	1,055	-38	52	42	-2.1	61	232	14.3	688	732
COKING LAKE	180,651	222,041	41,390	1,604	1,443	-161	7,148	16,143	8.5	25,832	37,812	3.9	29,853	47,145
COULDER	11,514	10,300	-1,214	347	341	-6	195	1,004	18.8	554	1,066	6.8	8,254	6,274
COULDER	37,904	53,303	15,399	3,192	2,708	-484	1,543	3,620	8.9	8,317	11,899	3.6	6,570	9,893
COULDER	3,156	6,365	3,209	573	442	-131	195	444	8.6	187	503	10.4	961	1,365
COULDER	44,667	42,011	-2,656	1,335	1,147	-188	1,223	2,344	4.4	4,855	5,500	1.4	11,866	14,805
STATE TOTAL	891,283	580,214	-311,069	20,244	10,330	-9,914	13,616	41,814	8.8	50,216	73,000	4.0	134,011	127,463
U.S. Total (in millions)	82.5	97.8	15.3	4.6	4.2	-0.4	3.3	3.9	1.6	10.1	19.7	9.1	11.3	17.8

¹ - Average annual growth rate.

(D) - Not shown to avoid disclosure of confidential information.

Source: BEA, April, 1978.

Table 1.1.1-3. Earnings by economic sector for selected counties in Utah, 1967-1977 (in millions of 1977 dollars).

COUNTY	TOTAL EARNINGS			AGRICULTURE			MINING			CONSTRUCTION		
	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE
Beaver	11.26	13.9	0.5	2.7	3.7	3.2	(0)	(0)	(0)	(0)	1.13	(0)
Davis	466.5	607.5	3.4	3.3	4.3	10.6	1.2	46	6.2	11.42	39.4	16.2
Iron	30.34	54.19	3.1	5.9	36	10.5	2.6	4.03	1.1	2.8	4.52	4.9
Utah	15.96	14.33	-1.1	1.69	.93	-6.8	2.96	2	-21.6	36	5	3.3
Millard	18.43	22.3	1.9	5.8	4.65	-3.2	(0)	.92	(0)	.67	91	1.9
Salt Lake	1957.3	3108.3	4.7	9.29	7.31	-2.3	93.84	141.69	5.4	120.2	271.3	8.5
Tooele	129.2	142.6	1.0	.65	1.18	10.6	1.95	43	-14.0	3.13	21.12	21.0
Utah	320.3	640.3	5.6	14.49	3.52	-3.1	3.2	6.6	7.5	24.39	53.2	9.3
Washington	20.36	49.96	5.8	3.25	2.35	-3.2	(0)	.39	(0)	2.55	5.51	8.0
Weber	432.1	432.9	1.3	6.34	2.37	-3.3	1	1.27	39.9	26.39	36.8	3.4
State	6010.5		4.2	119.2	92.4	-3.6	155.4	319.15	7.2	226.3	542.65	9.1
U.S.	921,344	1,163,755	2.4	31,350.7	29,163	-2.0	9,215.6	10,115	6.4	54,730.6	69,617	2.4

COUNTY	MANUFACTURING			SERVICES			GOVERNMENT		
	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE
Beaver	(0)	36	(0)	34	2.9	0.6	2.29	3.64	2.8
Davis	43.68	69.89	4.8	20.04	48.18	9.2	143.5	349.65	9.2
Iron	2.14	3.31	5.1	4.38	6.14	3.2	9.9	15.97	4.9
Utah	4.53	5.14	1.4	1.4	1.13	-0.8	2.66	3.98	1.5
Millard	52	1.45	19.9	1.14	1.33	0.3	4.67	7.03	1.8
Salt Lake	134.1	195.5	3.7	99.8	42.3	-5.2	301.6	459.4	4.3
Tooele	3.21	17.99	4.7	7.9	1.94	-3.0	154.3	96.14	-3.9
Utah	116.1	7.37	-2.3	13.67	14.3	2.3	13.91	63.3	4.1
Washington	7.41	1.4	-3.3	6.49	3.4	-3.3	7.37	11.37	4.3
Weber	11.64	34	1.0	2.99	8	3.3	11.5	14.3	0.4
State	4.7	10.1	3.1	52	3	-3	21.3	310.3	2.0
U.S.	9,579	1,134	3	1,299.3	1,004.5	-2.3	171.99	1,034.7	3.3

Table 1.1.1-4. Per capita income and earnings shares by economic sector, selected Utah counties, 1977.

COUNTY	1977 PER CAPITA INCOME	TOTAL 1977 EARNINGS (000s of \$)	COUNTY PERCENT OF TOTAL	AGRICULTURE SHARE (PERCENT)	MINING SHARE (PERCENT)	CONSTRUCTION SHARE (PERCENT)	MANUFACTURING SHARE (PERCENT)	SERVICES SHARE (PERCENT)	GOVERNMENT SHARE (PERCENT)
Beaver	5,114	13,900	0.2	6.9	3.4	8.2	6.9	5.8	21.8
Davis	5,860	602,505	10.0	0.6	0.1	6.6	11.6	8.0	58.0
Iron	4,693	54,175	0.9	1.8	7.4	8.4	6.8	11.3	29.4
Juab	3,797	14,328	0.2	5.8	4.9	2.8	36.0	7.0	21.5
Millard	3,978	22,296	0.4	20.8	4.3	3.6	6.5	7.0	25.0
Salt Lake	6,712	3,108,320	51.7	0.2	4.6	8.7	15.9	15.8	14.7
Tooele	5,684	142,636	2.4	1.2	0.3	14.8	12.6	9.8	60.4
Utah	4,854	640,317	10.7	1.5	1.0	9.2	31.5	22.7	13.7
Washington	4,381	49,961	0.8	4.7	0.8	11.0	10.8	14.5	22.9
Weber	6,158	492,894	8.2	0.5	0.3	7.5	14.0	14.8	31.4
State	5,943	6,010,516	100.0	1.4	5.2	9.0	16.8	14.2	22.3
U.S.	7,026	1,164,755,000		2.2	1.6	6.0	26.2	16.6	17.1

Source: BEA, 1979.

575-1

base represents a smaller than average county in Utah, \$35.3 million in Millard County and \$3.0 million in the City of Delta (Table 1.1.2-1). The general fund revenue structure of the potentially affected government units reflect a dependence on intergovernmental revenue transfers. Table 1.1.2-2 and Table 1.1.2-3 indicate the levels of revenues and expenditures in Millard County and the City of Delta, respectively. Intergovernmental revenues account for 62 percent and 63.2 percent of general fund receipts in Delta and Millard County, respectively; more than double the locally raised revenues (property tax, license and permits, fines and fees) in both jurisdictions.

Expenditure patterns differ widely between Millard County and the City of Delta. The deviation occurs in the Millard County budget, where public work expenditures are transferred in from the special revenue road fund. The result is a shifting of actual expenditure patterns within the general fund. Similarities do exist, however, in the public works expenditures for both jurisdictions. This category represents approximately one third of total general fund appropriations for Millard County and Delta. Delta additionally disburses another 34 percent of their general fund on public safety functions, while Millard County contributes only 16 percent. It is noted that Millard County's budget is ten times that of the City of Delta. Due to the relative size of Delta's budget, general fund revenues are first disbursed for necessary public services that maintain a safe and comfortable standard of living. As such, public safety and public works expenditures are considerably higher in percentage terms than Millard County's respective expenses. See Tables 1.1.2-2 and 1.1.2-3.

School district revenues and expenditures follow similar patterns across all districts in the State of Utah. Instruction expenses account for the largest single outlay (Table 1.1.2-4) of approximately 59 percent of total expenditures, excluding capital outlay and debt service. Fixed charges (insurance, pension payments) and operation and maintenance of the physical plant account for another 30.8 percent of maintenance and operation fund expenditures. Revenues for the Millard County School District are heavily dependent on state revenue (Table 1.1.2-5). These revenues account for over 60 percent of maintenance and operating fund revenues, almost double that of the 33.7 percent in local contributions. Federal sources of \$169,000 are earmarked for special purposes and constitute a minor share of revenues.

In summary, local governments in the Delta and vicinity area have less than adequate fiscal structures to support growth above low to moderate levels. Due to the less than average tax base of the governmental units, indebtedness levels are extremely low to support long term financing of major capital improvement projects. Reserve bonding capacities for Millard County and the school district are satisfactory, while the City of Delta has limited reserves of approximately \$780,000.

POPULATION AND COMMUNITIES (1.1.3)

Millard County, Utah is the primary area of analysis for the proposed operating base near Delta, with adjacent Beaver and Juab counties also included due to the probability of spillover of effects into those areas. Millard County's population, estimated as 8,297 in 1977 was 8,736 on April 1, 1980, according to preliminary 1980 census data, an increase of 25 percent since 1970. The population

Table 1.1.2-1. Valuation, indebtedness limitation and reserve bonding capacities, 1979.

JURISDICTION	ASSESSED VALUE	INDEBTEDNESS LIMITATION	OUTSTANDING G.O. BONDS	RESERVE BONDING CAPACITY
Millard County	35,251,922	2,820,153	0	2,820,153
School District	33,111,959	5,297,913	3,258,000	2,039,913
Delta City	2,993,687	778,989	0	778,989

1407-1

School Year, 1978-79.

Source: Utah Foundation, Statistical Review of Governments in Utah, 1979 Edition.

Table 1.1.2-2. General fund revenues and expenditures, Millard County, Utah, selected years.

	1977	1978
Revenues		
Property Tax	349,857	369,349
License and Permit	462	1,005
Intergovernmental Revenues	1,035,071	1,282,052
Fines and Fees	213,431	249,610
Other	125,292	126,291
Total Revenues	1,724,113	2,028,307
Expenditures		
Administration	371,759	410,293
Public Safety	144,741	210,893
Health and Welfare	10,354	33,553
Public Works, Parks and Recreation	467,464	623,672
Other	114,155	708,028
Total Expenditures	1,064,679	2,249,729

3408- 1

Source: Millard County, County General Fund, Statement of Revenues and Expenditures.

Table 1.1.2-3. General fund revenues and expenditures, City of Delta, Utah, fiscal year 1978-79.

Revenues	
Property Taxes	\$ 37,096
License and Permits	6,251
Intergovernmental Revenue	137,668
Fines, Fee and Charges	10,994
Other	30,138
Total General Fund	\$222,147
Expenditures	
Administrative	46,844
Judicial	1,042
Public Safety	76,440
Public Works	67,176
Parks and Recreation	13,253
Other	13,886
Transfers - T/O	4,000
Total Expenditures	\$222,681

3409 - 1

Source: City of Delta, General Fund Statement of Revenues and Expenditures for the Year Ended June 30, 1979.

Table 1.1.2-4. Summary of expenditures, by fund,
Millard County School District,
1977-78.

Maintenance and Operating Fund	
Administration	91,278
Instruction	1,829,180
Health Services	4,906
Transportation	188,743
Operation of Plant	274,763
Maintenance of Plant	132,977
Fixed Charges	545,535
Other	26,294
Total Maintenance and Operating Fund	3,093,676
Capital Outlay and Debt Service Funds	
Capital Outlay	1,470,227
Sites	157,747
New Buildings	1,177,954
Remodeling	1,445
Other	133,081
Debt Service	354,874
Total Capital Outlay and Debt Service Funds	1,825,101
Food Service Fund	248,634
Other Funds	32,671
Total — All Funds	5,200,082

3411

Source: Utah Office of the State Superintendent of
Public Instruction, 1978. 1977-78 Annual
Report of the State Superintendent.

Table 1.1.2-5. Summary of revenues,
all funds, Millard
County School District,
fiscal year 1977-78.

Maintenance and Operating Fund	
Local Revenue	985,377
Property Taxes	923,137
Other	62,140
State Revenues	1,765,874
Basic School Program	1,187,931
Other	577,943
Federal Revenues	168,893
Transfer Payments—In State	—
Total Maintenance and Operating Fund	2,920,344
Capital Outlay and Debt Service Fund	
Local Revenue	638,352
Property Taxes	511,028
Other	127,324
State Revenue	—
Federal Revenue	—
Non-Revenue	11,276
Sale of Bonds	—
Other	11,276
Total Capital Outlay and Debt Service Fund	649,628
School Food Services Fund	257,747
Other Funds	8,236
Total All Funds	3,835,655

3411

Source: Utah Office of the State Superintendent of
Public Instruction, 1978. 1977-78 Annual
Report of the State Superintendent.

of the sparsely settled county, which has a density of about 1.3 persons per square mile, is dispersed among a number of small communities, the largest of which are Delta and Fillmore. Beaver and Juab counties, whose populations were 4,377 and 5,516, respectively, in 1980, grew more slowly than Millard during the last decade.

Data for 1970 on the spatial distribution and age composition of the populations of Millard, Beaver, and Juab counties, shown in Table 1.1.3-1, indicate that all of Millard's population was classified as rural, although only 15 percent resided on farms. All three counties had populations whose age structure was slightly older than that in the state of Utah as a whole. Persons of school age constituted 31.4 percent, 28.7 percent, and 28.3 percent of the total population in Millard, Beaver, and Juab counties, respectively.

Components of population change including net migration and natural increases, or excess of births over deaths, are presented in Table 1.1.3-2 for the periods 1960 to 1970 and 1970 to 1976. Since 1970, Millard County has experienced a moderate level of in-migration, estimated by the Bureau of the Census as 7.5 percent of its 1970 population, while very small amounts of out-migration are estimated in Beaver and Juab counties. These two counties experience modest growth in the period since 1970 as a result of natural increases in population exceeding the level of out-migration.

Projections of future population, presented in Table 1.1.3-3 and Figure 1.1.3-1, indicate a continued pattern of moderate population growth in Millard County through 1994 when the population is projected to reach about 12,500. Population expansion associated with several proposed large-scale projects, including the Intermountain Power Project, Continental Lime and Martin Marietta Cement Plants, and Precision Built Modular Home Manufacturing, would substantially increase the county's population over the trend-growth projection. With those projects the county population is projected to grow at a rate of more than 12 percent annually during the five years from 1980 through 1985, although population would decline during the next five year period and grow more slowly from 1990 to 1994 (Table 1.1.3-4). The population growth due to those projects would increase Millard County's population to over 18,700 by 1985, although projected population in 1994, about 15,500 persons, would be lower.

LAND USE (1.1.4)

Community Land Use

Land use data for Delta, Utah is available from the "Six-County Development Plan" (1979) prepared by the Six-County Commissioners Organization (which also serves as the A-95 areawide clearinghouse). Delta in northeastern Millard County, is eligible to receive guidance in its local planning activities from the Commissioners Organization since Millard County is one of the six member counties. Millard County prepared a master plan in 1971 and was in the process of updating it in 1979, partially due to the proposed Intermountain Power Project and proposed M-X operating base at Delta. The county also adopted a zoning ordinance in 1969 and a subdivision ordinance in 1970. Table 1.1.4-1 shows the ordinances that have been adopted by the communities in Millard County and Juab County to the north.

Table 1.1.3-1. Selected population characteristics
in the Nevada/Utah impact region.
(Page 1 of 2)

STATE COUNTY	POPULATION				POPULATION DENSITY 1975 PERSONS/MI ²
	1960	1970	1975	1977	
Nevada					
Clark	127,016	273,288	330,714	361,095	42
Eureka	767	948	1,072	1,119	42
Lincoln	2,431	2,557	2,647	2,857	42
Nye	4,374	5,599	5,591	6,113	42
White Pine	9,808	10,150	10,221	8,776	2
Utah					
Beaver	4,331	3,800	4,086	4,079	2
Iron	10,795	12,177	14,609	15,444	4
Juab	4,597	4,574	4,947	5,156	2
Millard	7,866	6,988	7,878	8,297	2
Salt Lake	383,035	458,607	512,130	540,533	670
Utah	106,991	137,776	165,745	177,106	82
Washing- ton	10,271	13,669	18,127	19,809	7
Nevada	285,278	488,738	590,268	636,902	5
Utah	890,627	1,059,273	1,202,672	1,270,005	15

4028

Table 1.1.3-1. Selected population characteristics in the Nevada/
Utah impact region. (Page 2 of 2)

STATE COUNTY	RURAL - URBAN DISTRIBUTION (1970)			AGE DISTRIBUTION (1970)				MEDIAN AGE 1970 IN YEARS
	PERCENT RURAL FARM	PERCENT RURAL NON-FARM	PERCENT URBAN	PERCENT UNDER 5	PERCENT 5-17	PERCENT 18-64	PERCENT 65+	
Nevada								
Clark	0.4	5.1	94.5	9.5	26.4	39.0	5.1	27.0
Eureka	30.1	69.0	0	11.4	22.9	60.1	5.6	30.5
Lincoln	12.7	87.3	0	9.7	32.4	47.7	10.2	27.0
Nye	5.0	95.0	0	8.3	24.2	60.4	7.1	30.1
White Pine	2.2	36.7	41.1	10.0	28.2	53.0	7.9	26.0
Utah								
Beaver	8.4	91.6	0	8.4	28.7	51.3	11.6	29.7
Iron	3.0	21.6	74.7	10.5	25.9	56.0	7.6	22.4
Kane	2.6	27.9	66.4	10.2	28.3	49.3	12.2	27.5
Millard	15.0	85.0	0	9.3	31.4	46.6	12.6	27.0
Salt Lake	0.6	4.2	95.1	10.6	29.1	52.7	7.6	23.0
Utah	2.6	9.9	87.6	10.9	26.8	56.3	6.0	21.7
Washing- ton	2.0	45.4	51.8	10.2	29.3	48.2	12.3	22.4
Nevada	2.1	17.0	80.9	8.9	26.0	56.8	6.3	27.0
Utah	3.1	16.3	80.6	10.6	29.6	52.5	7.3	23.0

4025

Sources: U.S. Bureau of the Census, 1975 County and City Data Book, 1977 Population
Estimates for Counties and Incorporated Places Nos. 341 and 357, and
1970 Census of Population.

Table 1.1.3-2. Population change and components of change, 1960 to 1970 and estimated 1970 to 1976, by county, in the Nevada/Utah impact region.
(Page 1 of 2)

STATE COUNTY	ACTUAL POPULATION 1970	POPULATION CHANGE 1960-1970					
		COMPONENTS OF CHANGE				TOTAL CHANGE	
		NATURAL INCREASE		NET MIGRATION			
		NO.	PERCENT	NO.	PERCENT	NO.	PERCENT
Nevada							
Clark	270,288		29.8		85.4		115.2
Eureka	948		-2.5		26.1		23.6
Lincoln	2,557		4.6		0.6		5.2
Nye	5,599		8.1		19.9		28.0
White Pine	10,150		11.6		-8.1		3.5
Utah							
Beaver	9,800		9.3		-21.6		-12.3
Iron	12,177		16.4		-3.6		12.8
Juab	4,574		7.7		-8.2		-0.5
Millard	6,988		9.4		-20.6		-11.2
Salt Lake	458,607		18.8		0.9		19.7
Utah	187,772		23.1		5.7		28.8
Washington	13,669		16.8		16.3		33.1
Nevada	488,735		20.9		50.4		71.3
Utah	1,059,273		20.1		-1.2		18.9

4029

Table 1.1.3-2. Population change and components of change, 1960 to 1970 and estimated 1970 to 1976, by county, in the Nevada/Utah impact region.
(Page 2 of 2)

STATE COUNTY	ESTIMATED POPULATION 1976	POPULATION CHANGE 1970-1976					
		COMPONENTS OF CHANGE				TOTAL CHANGE	
		NATURAL INCREASE		NET MIGRATION		NO.	PERCENT
		NO.	PERCENT	NO.	PERCENT		
Nevada							
Clark	343,400	21,200	7.7	48,900	17.9	70,100	25.6
Eureka	1,200	(2)	1.3	300	26.9	300	28.2
Lincoln	2,800	100	2.6	100	5.5	200	8.1
Nye	5,900	100	1.4	200	4.3	300	5.7
White Pine	10,000	700	6.6	-800	-7.9	-100	-1.3
Utah							
Beaver	4,100	400	8.7	(2)	-1.2	300	7.5
Iron	14,700	1,700	14.0	800	7.0	2,600	21.0
Juab	4,900	400	8.5	-100	-1.2	300	7.3
Millard	8,200	700	9.4	500	7.5	1,200	16.9
Salt Lake	524,700	53,100	11.6	13,000	2.8	66,100	14.4
Utah	170,300	27,200	19.7	5,300	3.9	32,600	23.6
Washington	18,700	1,900	13.9	3,200	23.2	5,100	37.1
Nevada	610,000	31,000	6.3	90,000	18.5	121,000	24.8
Utah	1,228,000	134,000	12.6	35,000	3.3	169,000	15.9

4029

Source: U.S. Bureau of the Census.

Table 1.1.3-3. Projected population by county, assuming trend growth and assuming growth related to energy and mineral development projects in some counties, Nevada/Utah impact region, 1980-1994. (Page 1 of 2)

STATE / COUNTY	ESTIMATED POPULATION 1977 ¹	PROJECTED POPULATION ²			
		1980		1985	
		TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH
Nevada					
Clark	361,095	453,881	453,952	543,857	544,830
Eureka	1,119	1,089	1,089	1,169	1,169
Lincoln	2,857	3,657	3,658	4,043	4,049
Nye	6,113	8,267	8,268	10,799	10,804
White Pine	8,776	8,246	8,247	8,630	12,975
5-County Total	379,960	475,140	475,214	568,498	573,827
Utah					
Beaver	4,079	4,455	4,776	5,051	10,993
Iron	15,444	17,449	17,460	20,346	20,500
Juab	5,156	5,544	5,613	6,888	9,274
Millard	8,297	8,915	10,459	10,940	18,746
Salt Lake/ Utah	717,639	822,238	822,793	980,701	987,123
Washington	19,809	22,150	22,150	27,200	27,200
7-County Total	770,424	880,751	882,951	1,051,128	1,073,836
Deployment Region Total	1,150,384	1,355,891	1,358,165	1,619,626	1,647,663

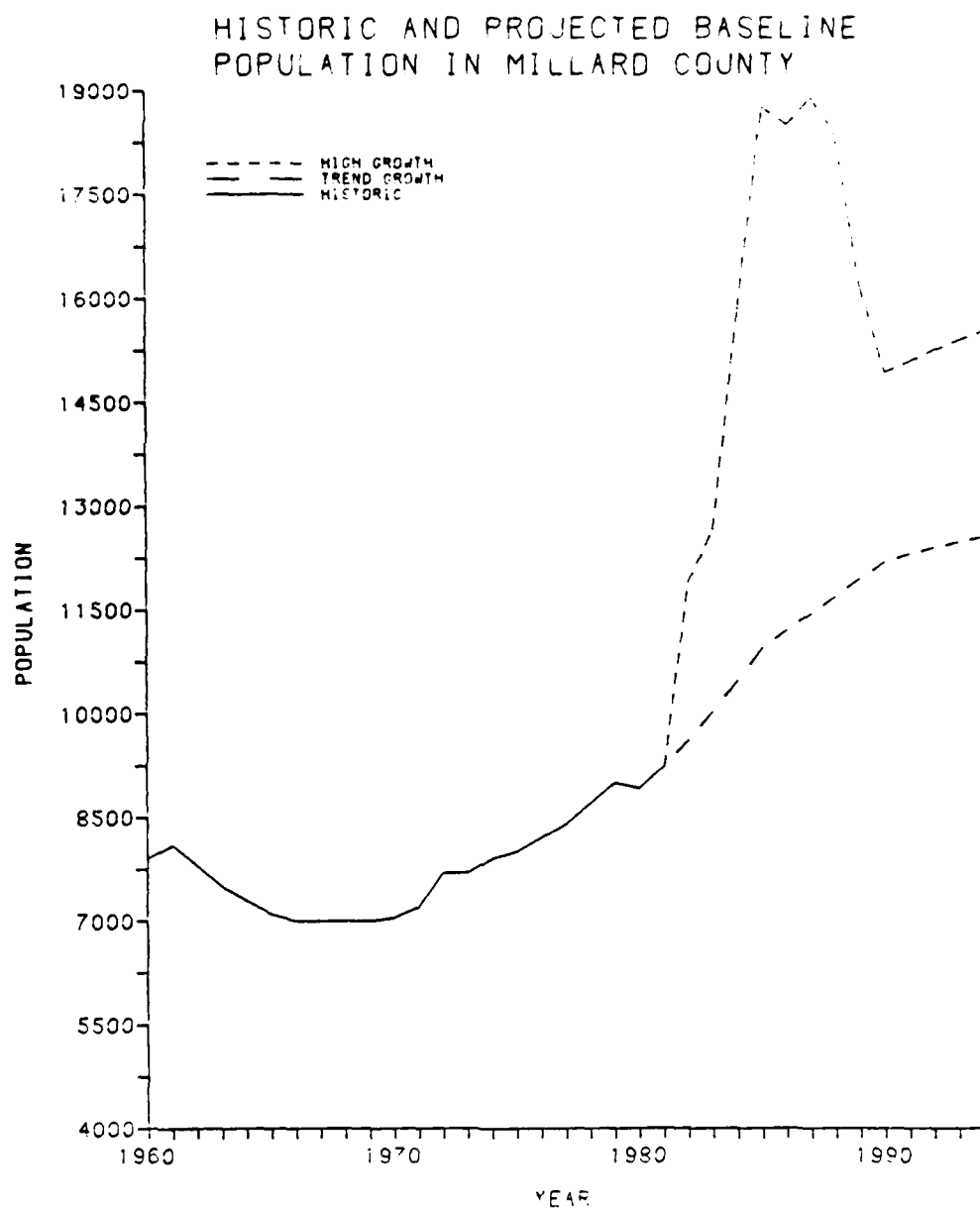
4030

Table 1.1.3-3. Projected population by county, assuming trend growth and assuming growth related to energy and mineral development projects in some counties, Nevada/Utah impact region, 1980-1994.
(Page 2 of 2)

STATE COUNTY	PROJECTED POPULATION ¹			
	1990		1994	
	TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH
Nevada				
Clark	623,794	624,539	686,699	687,585
Eureka	1,278	1,278	1,368	1,368
Lincoln	4,424	4,429	4,715	4,720
Nye	11,971	11,974	12,901	12,906
White Pine	9,545	13,902	10,238	15,050
5-County Total	651,012	656,122	715,921	721,629
Utah				
Beaver	5,297	9,965	5,516	10,566
Iron	22,895	23,006	24,556	24,677
Juab	7,650	8,364	8,077	8,849
Millard	12,179	14,920	12,528	15,504
Salt Lake/ Utah	1,079,131	1,083,344	1,144,685	1,149,699
Washington	31,150	31,150	33,802	33,802
7-County Total	1,158,302	1,170,749	1,229,164	1,243,097
Deployment Region Total	1,809,314	1,826,871	1,945,085	1,964,726

¹U.S. Bureau of the Census, 1977 Population Estimates for Counties and Incorporated Places, Series P-25, No. 841 (Nevada) and No. 857 (Utah), November 1979.

²Bureau of Economic and Business Research, University of Utah, 1980.



CA-0050-A

Figure 1.1.3-1. Historic and projected baseline population in Millard County.

Table 1.1.3-4. Projected annual compound growth rates by county, assuming trend growth and high growth associated with energy and mineral development projects, Nevada/Utah impact region.

STATE COUNTY	PROJECTED ANNUAL COMPOUND RATES OF POPULATION CHANGE							
	1977-1980		1980-1985		1985-1990		1990-1994	
	TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH
Nevada								
Clark	7.92	7.93	3.68	3.72	2.78	2.77	2.43	2.43
Eureka	-0.90	-0.90	1.43	1.43	1.80	1.80	1.72	1.72
Lincoln	8.58	8.58	2.02	2.02	1.79	1.79	1.61	1.61
Nye	10.59	10.59	5.49	5.49	2.08	2.08	1.89	1.89
White Pine	-2.06	-2.06	0.91	9.49	2.04	1.39	1.77	2.00
5-County Total	7.74	7.74	3.65	3.84	2.75	2.72	2.40	2.41
Utah								
Beaver	2.98	5.40	2.54	18.14	0.96	-1.94	1.02	1.47
Iron	4.15	4.17	3.12	3.26	2.39	2.33	1.77	1.77
Juab	2.45	2.87	4.44	10.56	2.12	-2.04	1.37	1.42
Millard	2.42	8.02	4.18	12.38	2.17	-4.46	0.71	0.96
Salt Lake/Utah	4.64	4.66	3.59	3.71	1.93	1.88	1.49	1.50
Washington	3.79	3.79	4.19	4.19	2.75	2.75	2.06	2.06
7-County Total	4.56	4.65	3.60	3.99	1.96	1.74	1.50	1.51
Deployment Region Total	5.63	5.69	3.62	3.94	2.24	2.09	1.83	1.84

4032

Source: HDR Sciences, based on projections by the Bureau of Economic and Business Research, University of Utah, 1980.

Table 1.1.4-1. Inventory of plans and ordinances - Millard and Juab Counties (1979).

COUNTY	SUBDIVISION	ZONING	MASTER PLAN	PLANNING COMMISSION	MOBILE HOME ORDINANCE	WATER AND SEWAGE	NEEDS UPDATING
Millard	X(1970)	XI(1969)	P(1971)	X	X(1969)	X	
Kanosh							
Meadow							
Fillmore	X	X		X		X	
Leamington							
Lynndyll							
Holden							
Scipio							
Delta	X	X		X		X	
Oak City							
Hinckley							
Juab	X(1974)	X(1966)		X	X(1974)		
Eureka							
Levan							
Mona	X						
Nephi	X	X		X		X	

4095

Key: X-Complete
 (19xx)-Date Adopted
 I-Needs Updating
 P-In Process of Updating

Source: Six - County Commissioners, 1979. "Six County Development Plan"

The "Six County Development Plan," completed in 1979, provides basic information for Millard and Juab counties relative to land use, economics, public facilities, transportation, mineral development, housing, recreation, social and cultural development and a range of other associated fields. The topic that this report and other similar reports do not cover is the establishment of goals and policies relative to development in Millard County. These development standards can only be generated from within by concerned citizens and their elected public officials acting in concert to make decisions relative to the future of the County.

The "Six County Development Plan" identified land use patterns in Millard and Juab counties and its communities and classified land use according to residential, commercial, industrial, public, transportation, agriculture and vacant land. The acreages are shown in Table 1.1.4-2. The Development Plan also identifies the Sevier River Valley area around Delta as the primary zone of irrigated and dry crop agriculture in Millard County.

Delta is located in the area being considered for most development in the County. Being the largest town in the valley, Delta would become the natural "center" for most activities and developments proposed nearby. While slightly larger than Fillmore in total population, Delta must still be considered to be a small, rural community in terms of land use. At the present time, only about 367 acres are devoted to residential use of all types while 343 acres are still used for agricultural purposes. Commercial development accounts for only 23.5 acres and industrial development for only 9 additional acres. The large, wide streets use up 115 acres and the total land area of the city is only 838.4 acres at the present time. Extensive lands in the Delta area are in private ownership. Table 1.1.4-3 provides data on land ownership in Millard County.

Implementing ordinances, zoning and subdivision ordinances are non-existent in most of the communities in Millard County. Historically, growth has been very slow in the county and the small amount of development that has taken place has required very little control or supervision.

Rural Land Use

Land use/land ownership patterns near Delta are shown in Figure 1.1.4-1.

Oil/gas leases are present in concentrations west of the Delta OB. In addition, construction and operation of the already approved and funded Intermountain Power Project will interact with the socioeconomic impacts of M-X basing at Delta.

The Corps of Engineers map, prepared on the basis of BLM computer printouts, shows a block of unpatented mining claims 10 mi to the northwest of the Delta OB study area. An established recreation area, Little Sahara, is near the proposed base.

Agriculture

Irrigated cropland is located in the vicinity of the city of Delta. The land in this area is used mainly for BLM administered grazing. The OB site facilities would be located in the Topaz Planning Unit where the BLM permits 29.2 acres per AUM for a total grazing authorization of 74,105 AUMs.

Table 1.1.4-3. Land ownership - Millard County, 1978.

STATE OWNED		FEDERALLY OWNED		PRIVATELY OWNED		TOTAL ACRES
ACRES	%	ACRES	%	ACRES	%	
428,820	9.9	3,347,129	77.0	571,315	13.1	4,347,264

449

Source: Architects/Planners Alliance, Inc. *Socioeconomic Analysis—
Lunndyl Alternative Site.* Salt Lake City, Utah, 1979.

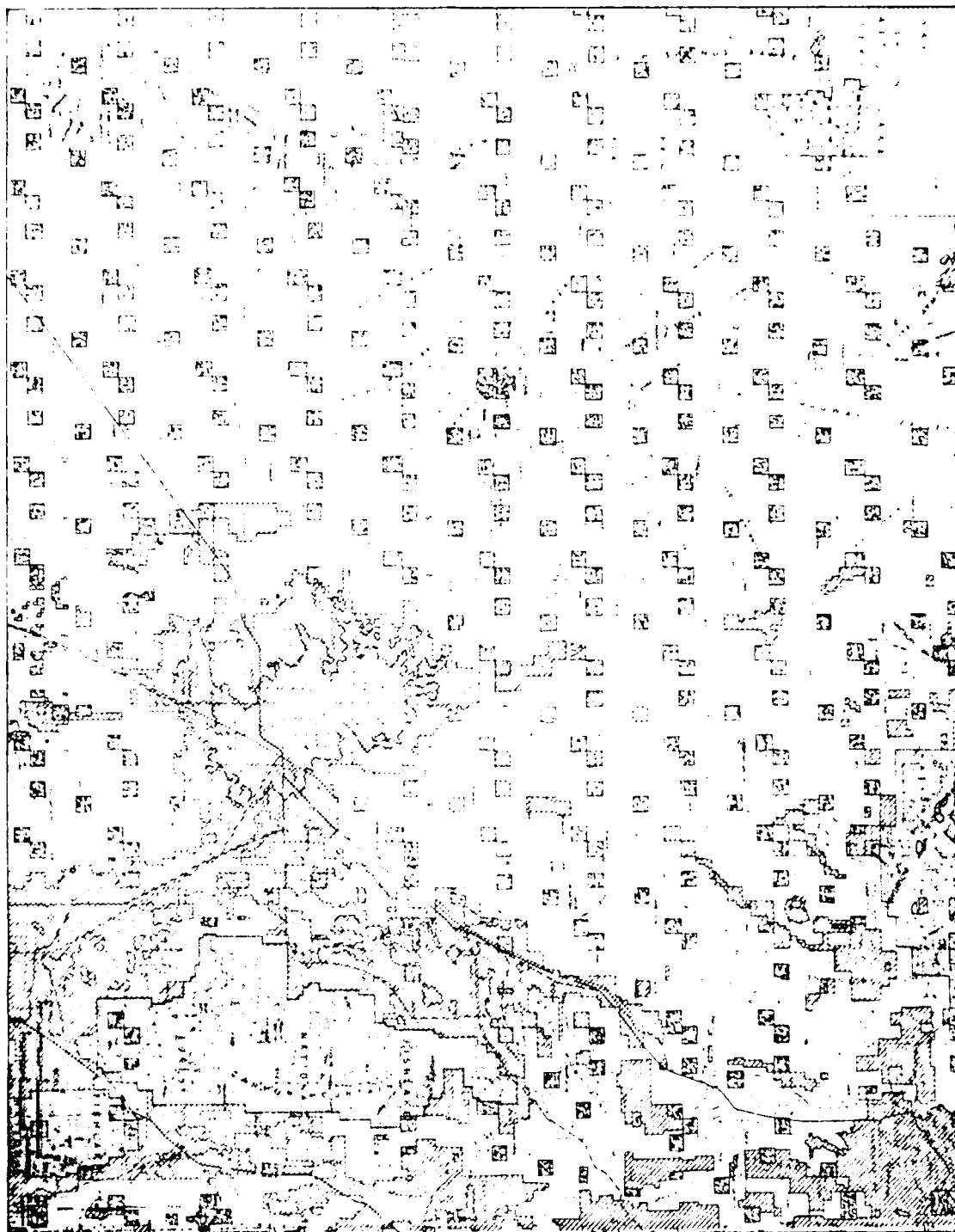


Figure 1.1.4-1. Current land use land ownership in the vicinity of Delta, Utah (Page 1 of 2).

LEGEND

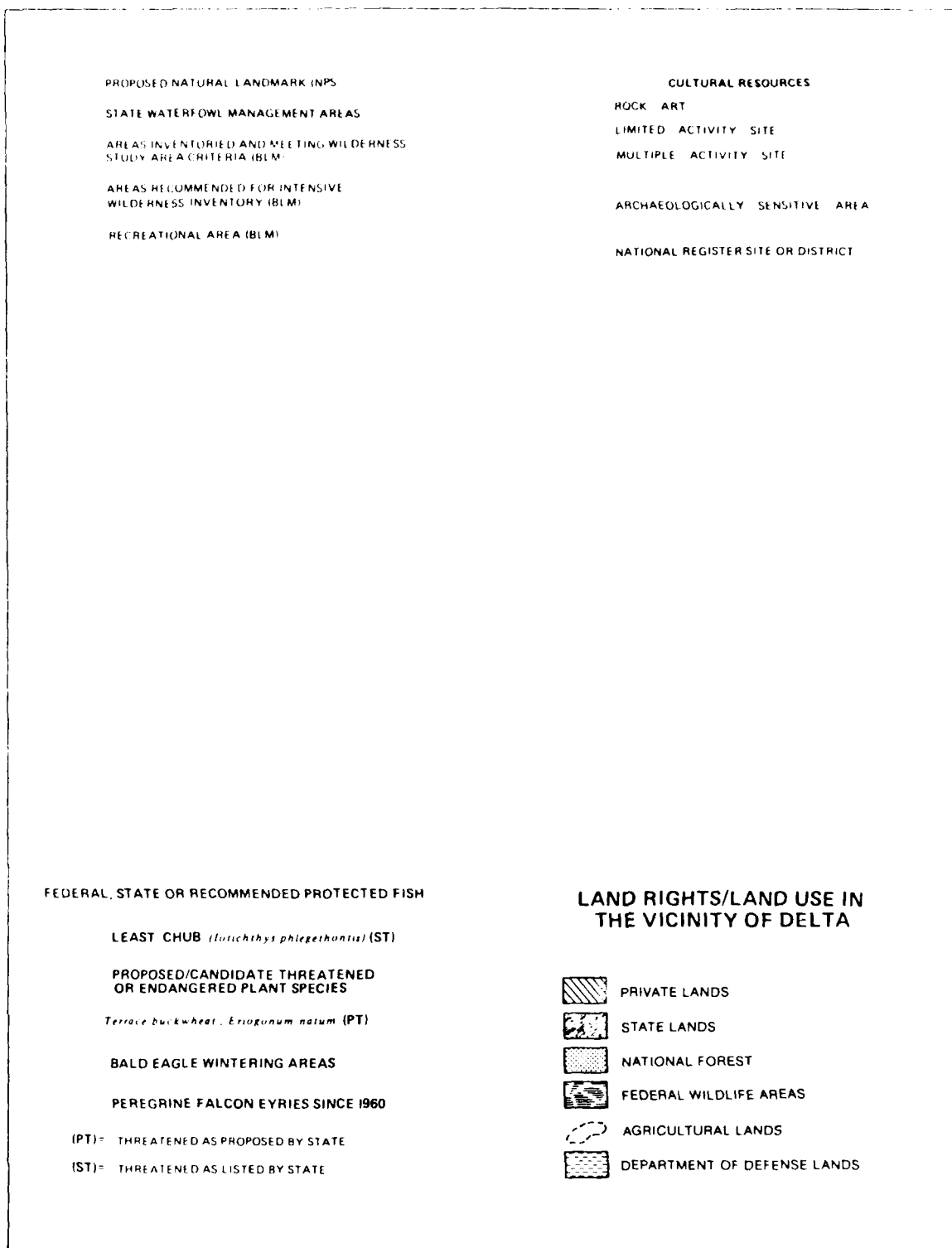


Figure 1.1.4-1. Rural land use/land ownership in the vicinity of Delta, Utah (Page 2 of 2).

Recreation

No fishing or concentrated recreation sites are located in the vicinity. Because this area is mostly under public ownership, it is used for dispersed recreation, small-game hunting, collecting activities, and off-road vehicle use.

Mining

No mining sites are located on land designated for the proposed OB.

LAND OWNERSHIP (1.1.5)

Outside of a 10-mi radius around Delta about 90 percent of the land is federally owned, with an average of four sections out of every township (36 mi²) being in state control. Within the approximate 10-mi radius around Delta, the land is almost entirely under private ownership. Table 1.1.4-3 provides data on land ownership in Millard County.

HOUSING (1.1.6)

Over the last two decades, Millard County has had a mixed experience in housing growth. From 1960 to 1970 the number of housing units actually declined from 2,417 to 2,412, but in the next six years the average annual growth rate increased to 4.3 percent, so that by 1976 there were an additional 694 units, totalling 3,106. The proportion of the county's housing stock in single family units decreased from 94.4 percent in 1970 to 88.2 percent in 1976, while the share of multi-family units and mobile homes increased from 5.6 to 11.8 percent over the same period.

It is estimated from annual permits authorizing residential construction that, in the 1970 to 1979 period, an average of 30 conventionally built housing units were added each year, with a maximum annual addition of 56 in 1978. In 1976 there were approximately 339 mobile homes in Millard County, constituting a 10.9 percent share of the housing units. In 1970, 85.5 percent of the housing units were owner occupied.

COMMUNITY INFRASTRUCTURE (1.1.7)

Organization

Delta is located in the northeastern section of Millard County. Fillmore, although slightly smaller in population than Delta, is the county seat and is located about 35 mi southeast of Delta. Nearly 50 percent of the population in Millard County resides in these two cities with the remaining population scattered throughout communities located in areas north and south of Fillmore and around Delta. These communities include Hinckley, Holden, Kanosh, Leamington, Lynndyl, Meadow, Oak City, and Scipio.

Millard County is a part of the Six-County Commissioners Organization which as a body administers most of the state and federally funded programs for the region. At the county level a council of governments helps public officials to combine efforts and work collectively to overcome local problems and restraints.

Education

The Millard County School District with an enrollment of 2,176 pupils operates three elementary schools, one junior high, and two senior high schools. Historical enrollment levels have shown a slight decrease from 1974 to present, by approximately 30 students. Projected future enrollment levels describe a slight increase in elementary enrollments with a small decrease in other grade levels. Presently, enrollments total 1,042 elementary level students, 266 junior high students, and 875 senior high students. Approximately 90 teachers as well as 15 specialists serve the school district, as presented in Table 1.1.7-1. Future plans involve replacing one old building at Millard High School with a new facility, although no additional space will be available. See Table 1.1.7-2 for a list of the educational facilities in Millard County.

Health Care

The West Millard Hospital in Delta contains 36 beds, 18 of which are for acute care. Fillmore has an acute care hospital with 22 acute care beds and several nursing care beds. The county is served by five physicians, three in the Delta/Lynndyl area and two supporting the Fillmore area. Seven full-time registered nurses and six licensed practical nurses serve the area, as well as four dentists and two mental health workers. Delta is attempting to recruit an additional physician to the area. Millard County is also served by 29 emergency medical technicians, and ambulance service is provided from Delta to Payson, Provo, and Salt Lake City (Table 1.1.7-3).

Police Protection

There are three city police officers serving Delta, as shown in Table 1.1.7-4. Millard County has one sheriff and three deputies patrolling the county with additional help from six Utah Highway Patrolmen. Approximately four more officers and additional equipment are needed to adequately meet the present community needs.

Fire Protection

Fire protection services in Millard County are provided by volunteer firefighters. Both areas have an adequate fire insurance rating of 7. Approximately 25 firemen serve Delta and 30 firemen serve the Fillmore area (Table 1.1.7-5).

Water Supply and Distribution

Delta has water rights for 1,910 gpm and acquires its water from three wells. Water use averages 238 gpcd and peaks at about 520 gpcd. Average use is nearly 0.5 MGD for the city. Storage capacity, 0.6 MG in two steel tanks, is 65 percent of ideal storage standards including 300,000 gallons for a two-hour fire flow. Each storage reservoir is served by a 10 in. main. The Delta water system has sufficient capacity in all respects for current requirements except for storage. However, should demand increase beyond present supply capacity, arrangements for additional water rights will require some study since the Delta groundwater basin is now over appropriated. The population of Delta City is projected to be 2,800 persons by 1987 from normal growth and is projected to increase to 5,300 persons if the Intermountain Power Project goes ahead as planned.

Table 1.1.7-1. Summary of educational statistics for study area locations.

COUNTY	ENROLLMENTS	EXCESS CAPACITY	TEACHERS	PUPIL/TEACHER RATIO	FUTURE PLANS
¹ White Pine County	1,662	1,060	91	18.3	Not Available
² Clark County	86,479 (79')	Very Little	3,730	23.1	Development Occurring
³ Iron County	4,052	40	191	21.2	School Bond passed to build new elementary school.
⁴ Beaver County	1,026	650	53	19.4	Not Available
⁵ Millard County	2,176	134	88	24.7	Remodeling Occurring
⁶ Dallam County	1,600	100	102	15.7	Available land for future expansion.
⁷ Curry County	7,850	1,875	417	18.8	Expansion of classrooms in all levels is planned.
⁸ Lincoln County	911	170	54	16.9	Not Available

¹Nevada Department of Education, 1979-80. Enrollment and Certified Personnel Information, Volume 22.

Research Bulletin, Nevada Department of Education.

²Nevada Department of Education, 1979-80. Enrollment and Certified Personnel Information, Vol. 22.

Research Bulletin, Nevada Department of Education.

³Iron County School District. 20 May 1980. C. Morris, School Superintendent - Telephone Communication.

⁴Beaver County School District. 20 May 1980. L. Haslam, School Superintendent - Telephone Communication.

⁵Millard County School District 20 May 1980. Ken Topham, School Superintendent - Telephone Communication.

⁶Dalhart Independent School District. 22 May 1980. D. Williams, School Superintendent - Telephone Communication.

⁷Cannon Air Force Base Environmental Coordinator, 1975. Tab A-1. Environmental Narrative, Clovis, New Mexico.

⁸U.S. Department of the Interior (BLM), Social-Economic Profile, Lincoln County, July 1976.

Table 1.1.7-2. Education facilities in Millard County.

FACILITY	LOCATION	1979-80 ENROLLMENT	CAPACITY
Elementary K-4	Delta	510	510
Delta Middle 5-7	Delta	266	300
Delta High 8-12	Delta	480	580
Garrison Elementary 1-8	Garrison	7	25
Elementary K-6	Fillmore	525	500
Millard High 7-12	Fillmore	395	395
Total		2,176	2,310

4096

Source: Ken Topham, School Superintendent, Millard County. May, 1980.

Table 1.1.7-3. Health services and facilities in study area locations.

COUNTY	HOSPITAL FACILITIES	PHYSICIANS	PHARMACIES	PHYSICIAN	DEPT. OF HEALTH	MENTAL HEALTH SERVICES	REMARKS
White Pine County ¹ City	44 Acute	4		10 PR 10 LPR 40 Beds	3	6	Bedding and medical equipment on hand - 90,000
Fork County ² Logan Springs Area	1067 Acute 910 Long Term	500 (DR ³)		1412 PR 594 LPR	N/A	N/A	
Fremont County ⁴ Beryl and Vicinity	23 Acute	15		35 Nurses	10	2	Community health center activity in hospital - The center of population rate is less than 50 percent.
Bozeman County ⁵ Billford and Vicinity	12 Acute 20 Long Term	1		6 PR 2 LPR	1 Part-time	0	
Billard County ⁶ Bella and Vicinity	18 Acute 18 Long Term	5		7 PR 6 LPR	4	2	
Ballou and Bartley Counties ⁶ Ballard and Vicinity	67 Acute 80 Long Term	5		10 PR 20 LPR	4	N/A	Expansion plans are in process to double the number of doctors and hospital beds in area.
Curry County ⁷ Charlie and Vicinity	106 Acute 100 Beds at Cannon AFB	22		110 Nurses	18	12	Hospital is closed at 65 percent.
Lincoln County ⁸ Panaca, Pioche, Caliente and Vicinity	10 Acute 9 Skilled Nursing	2		6 PR 8 AIDS	1	N/A	

¹ Nevada Bureau of Business and Economic Research, July 1977. Socioeconomic Analysis of the White Pine Power Project, Reno, Nevada. 1340-1

² Clark County Health District, 6 June 1980. A Deane, Health Planner. Telephone conversation.

³ Bureau of Economic and Business Research 1979. Community Economic Facts - Cedar City.

⁴ Willford Valley Memorial Hospital, 6 June 1980. J. Williams, Director of Nursing. Telephone conversation.

⁵ Architects/Planners Alliance, Inc. 1979. Socioeconomic Analysis - Lundy Alternative Site, Ball Lake City.

⁶ Ballard Hospital, 6 June 1980. A. Peterson, Director of Nursing. Telephone conversation.

⁷ Clevis High Plains Hospital, 6 June 1980. G. Griedley, Director of Nursing. Telephone conversation.

⁸ U.S. Department of Interior (BIA), Social Economic Profile, Lincoln County, July 1976.

Table 1.1.7-4. Police protection characteristics in study area locations.

COUNTY/COMMUNITY	POLICE OFFICERS	SHERIFF	HIGHWAY PATROL
White Pine County ¹ Ely and vicinity	13	15	3
Clark County ² Coyote Springs area	738	Serves Area	Serves Area
Iron County ³ Beryl and vicinity	15	Serves Area	Serves Area
Beaver County ⁴ Milford and vicinity	2	Serves Area	Serves Area
Millard County ⁵ Delta and vicinity	3	4	6
Dallam/Hartley Counties ⁶ Dalhart and Vicinity	7 (Dallam) 0 (Hartley)	14 (Dallam) 2 (Hartley)	Serves Area
Curry County ⁷ Clovis and Vicinity	72	Serves Area	Serves Area
Lincoln County ⁸ Panaca, Pioche, Caliente	6	7	1

1349

¹White Pine County Sheriff's Department, 5 June, 1980. M. Burns, Deputy, telephone conversation.

²Las Vegas Police Department, 5 June 1980. Officer Bottomly, Personnel Officer, telephone conversation.

³Bureau of Economic and Business Research, 1979, Community Economic Facts—Cedar City.

⁴Five County Association of Governments, 1976, *Planning for Growth in Beaver County*, Beaver County Planning and Development Agency.

⁵Architects/Planners Alliance Inc. 1979. Socioeconomic Analysis—Lynndyl Alternative Site, Salt Lake City.

⁶Pannhandle Regional Planning Commission, 22 May 1980. M. Menderdine, Planner, telephone conversation.

⁷Clovis Police Department, 5 June 1980, V. Garcia, Secretary I, telephone conversation.

⁸U.S. Department of Interior (BLM), Social-Economic Profile, Lincoln County, July 1976.

Table 1.1.7-5. Fire protection characteristics in study area locations.

COUNTY/COMMUNITY	FULLTIME FIRE DEPARTMENT	VOLUNTEER FIRE DEPARTMENT	FIRE INSURANCE RATING	COMMENTS (Appendix 1.1.7-5)
White Pine County, Nev. ¹	5 Paid Staff	45 Volunteers	5	Rescue mini pumper, 250 gallon capacity 1300 gallon/minute pumper, 1000 gallon capacity 1350 gallon/minute 1 GAC tank/pumper combination 650 gallon/minute La France, 240 gallon capacity 350 gallon/minute La France, 240 gallon capacity 750 gallon/minute pumper, 500 gallon capacity 1500 gallon/minute Walter Packer truck 9 Fire trucks and 2 snorkler trucks
Clark County, Las Vegas ²	254 Fire Fighters	-	3 (will move into "2" rating soon)	
Iron County, Cedar City ³	3 paid staff	32 Volunteers	5	4 pumper trucks (1,250 and 750 gallon) 2 brush trucks 1 crash truck at airport 1 snorkle truck Several ambulances
Seaver County, Milford ⁴	-	High School Students act as Volunteer Fireman	7	Several pumper trucks
Millard County, Delta ⁵	-	25 Volunteer	7	3 pumper trucks (500, 750, and 1,000 gallon)
Fillmore	-	30 Volunteers	7	3 pumper trucks (500, 750, and 1,000 gallon)
Dallam and Hartley Dalhart ⁶	1 paid staff	30 Volunteers	24½ Key Rating Rating Range from 1½ (excellent) to \$1.00 (poor)	Two 1,500-gallon pumper truck One 250-gallon mini-pumper One back-up pumper (old) Five 4-wheel drive vehicles
Curry County Clovis ⁷	75 Fireman (EMP trained)	-	6 (will move into a "4" soon)	Eight 1,500-gallon pumpers Two snorkle units One crash truck and several ambulances
Lincoln County ⁸ Panaca, Pioche, Caliente	-	55-60 Volunteers	7 Pioche, Caliente, 8 Panaca	One 250-gallon pumper Four 500-gallon pumpers One 450-gallon pumper Two 125-gallon slip on units

1350-1

¹Ely Fire Department, 5 June 1980, F. Ritchie, Dispatcher, telephone conversation.

²Las Vegas Fire Department, 5 June 1980, R. Horrocks, Chief Secretary, telephone conversation.

³Cedar City Fire Department, 6 June 1980, C. Neilson, Fire Marshall, telephone conversation.

⁴Five County Association of Governments, 1976, Planning for Growth in Beaver County, Beaver County Planning and Development Council.

⁵Architects/Planners Alliance Inc., 1979, Socioeconomic Analysis (Appendix 1.1.7-5), Salt Lake City.

⁶Dallam Fire Department, 10 June 1980, M. Shippe, Fire Chief, telephone conversation.

⁷Curry Fire Department, 10 June 1980, J. Carter, Fire Chief, telephone conversation.

⁸U.S. Department of Interior (BIM), Social Economic Profile, Lincoln County, July 1976.

Wastewater Collection and Treatment

The wastewater collection system in Delta consists of vitrified clay pipe, some oakum and some open joints, asbestos concrete pipe, and PVC pipe. The system consists of about 8.5 mi of pipe and 90 manholes, with no storm drain connections to the system. Approximately 775 connections to the system generate an average daily flow of 0.4 MGD. The wastewater treatment facility at Delta was constructed in 1971, and consists of a 6-cell stabilization lagoon. The facility was designed for a population of 3,500 persons plus an additional BOD load of 200 pounds from industry and has a current capacity of 0.5 MGD. Present domestic flow load factors are 150 gpcd and 0.17 pounds BOD. The system will detain an average daily flow of 0.525 MGD for 150 days before discharge is necessary. Through 1979, only cells 1, 2, and 3 have approached capacity and the system has operated as a complete containment lagoon without discharge. The wastewater collection system is adequate for current conditions and can sustain additional growth of more than 100 connections, while treatment facilities could sustain an additional 3,000 residents.

Solid Waste

Each of the five cities in West Millard County and three unincorporated areas have open dumps in which to dispose of solid waste. The open dump in Delta has existing available capacity of 10 acres. Fillmore has a 40 acre site with approximately 32 acres yet unused. Residents must haul their waste to these open dumps as no pickup services are provided in Millard County. Millard County officials are planning to consolidate and centralize all solid waste facilities into one or two sanitary landfills in order to meet federal requirements and health regulations.

Parks and Recreation

Millard County has within it several major recreational facilities, including Territorial Statehouse, a facility of the Utah Division of Parks and Recreation, and a number of U.S. Forest Service sites in nearby Fishlake National Forest: Adelaide, Meadow Creek, Shell Oil Site, Copley Cave, Shingle Mill, Buckskin Charly, Pistol Rock, Maple Hollow, Maple Grove, Plantation Flat, and Oak Creek Maple Grove. In addition, Table 1.1.7-6 describes selected urban recreational facilities in Delta. Delta maintains a total of 5 acres of city-owned parks and 26 acres of school/church recreation areas. At present approximately 12 additional acres of parks are needed.

QUALITY OF LIFE (1.1.8)

Delta is a small community located in a cluster of small towns, which are primarily agricultural in their background and character. Delta is the center for alfalfa seed production in the state and is dependent on irrigation from the Sevier River. Millard County population has been slowly declining. From 1970 to 1977 this trend has reversed and the county has grown at a rate of 2.5 percent during this time (Table 1.1.8-1).

It is a region characterized by a long period of out-migration as the number of farms has declined since 1940. Those residents who remain are typically those with a strong attachment to their community as home. In fact, in a recent survey of residents of the Delta area, it was revealed that 99 percent of the county residents reported that they considered the town they live in as home. They further indicated

Table 1.1.7-6. Selected recreation facilities data, 1979.

TYPE	OWNERSHIP	SIZE	FACILITIES
Delta			
Swimming pool	West Millard Recreation District	2 acres	84' x 75' pool, enclosed; restrooms/dressing rooms
City park	City of Delta	5 acres	Playground equipment, tourist information booth, pavillion; 2 lighted tennis courts, picnic tables.
Recreation Center	L.D.S. Church	5 acres	Basketball court
Ballfields	L.D.S. Church	2 acres	2 lighted ball diamonds
High School recreation area	Millard County School District	10 acres	Football field with bleachers, practice field; baseball field; 4 lighted tennis courts, gym
Middle School recreation area	Millard County School District	7 acres	Play area; basketball standard; gym
Elementary School recreation area	Millard County School District	5 acres	Playground equipment; ball field

4097

Source: Local West Millard County officials' and APA planning and research.

Table 1.1.8-1. Quality of Life Indicators, Millard County.

	WHITE 1970	PAFF KANSAS 1970	MIN. 1968	MAINS 1970	MT. PLEASANT 1970	PAFF 1970	PAFF AL. 1970	PAFF AL. 1970
Birth rate (live births per 1,000) Population under 14 (1970)	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4
Deaths								
Birth to 100,000 (live births per 1,000)	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
Deaths to 100,000 (live births per 1,000)	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
Deaths to 100,000 (live births per 1,000)	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
Median home value (1970)	17,447	23,194	17,447	17,447	17,447	17,447	17,447	17,447
Unemployment								
Unemployment Rate (1970)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Unemployment Rate (1970)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Unemployment Rate (1970)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Proportion of Population on Public Assistance (1970)	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4
Health								
Physicians per 1,000 population (1970)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Dentists per 1,000 population (1970)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Registered Nurses per 1,000 population (1970)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Hospital Beds per 1,000 population (1970)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Police Officers								
Police Officers per 1,000 population (1970)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Fireman per 1,000 population	NA	NA	NA	NA	NA	NA	NA	NA
Violent Crimes per 1,000 population (1970)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Crimes Against Property per 1,000 population (1970)	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Public Disasters								
Deaths per 1,000 population (1970)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Deaths per 1,000 population (1970)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Deaths per 1,000 population (1970)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Education								
Median School Years Completed (1970)	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
Public Teacher Salary	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4

1. U.S. Dept. of Commerce, Bureau of Economic Analysis, Abstract of the United States, 1970.

458-

Nevada, Bureau of Education, 1970, Research Bulletin, Vol. 11, to 1.

Nevada Superintendent of Public Instruction, 1970, Annual Report of the State Superintendent.

Nevada, Bureau of Economic Analysis, 1970, Nevada Statistical Abstract.

Nevada Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

Nevada, Bureau of Economic and Business Research, Statistical Abstract of Nevada, 1970.

that they would leave only with reluctance and two-thirds reported that the area they live in is about the "best community" they could live in (Architects/Planners Alliance, Inc. 1979).

Delta and the surrounding communities--Desert/Oasis, Hinkley, Learnington, Lyndvyl, Oak City, and Sugarville are agrarian small towns, with agriculture being the highest employment sector. High operating costs and low profit margins contribute to a low per capita income in the county. The 1977 per capita income was just under \$4,000/year, only 67 percent of the state average. Wages are currently low in most employment sectors. This would change if projects such as the Intermountain Power Project (IPP) were to locate in the area. The marginality of some farm operations is indicated by the observation that many farmers voluntarily sold their water irrigation rights to the IPP exchanging their traditional way of life for a guaranteed financial return.

The unemployment rate in the county is very low at 4.7 percent and the civilian labor force has been growing between 1970 and 1977 at the rate of 3.3 percent/year, somewhat below the state average of 5.6 percent, but well above the national average of 2.4 percent. Just over 20 percent of the county's population was on public assistance support during 1976, close to the national rate but well above the state average of 14.7 percent. The economy of the area is somewhat stagnant compared to the rest of the state.

Whereas residents view their community in very favorable terms, this is not to say that it is ideal in all regards. The public attitude survey indicated the perceived important advantages of the community were "access to outdoors", "air quality", and "community spirit" while significant disadvantages were perceived of as "appearance" and "opportunity to earn a living", which are rated by local citizens as characteristics of the area that "need improvements" (Architects/Planners Alliance, Inc. 1979). The perception of economic disadvantages associated with the area strongly disposes the local population to support additional economic growth for the region. Growth of new employment opportunities is perceived as the basis for reversing the flow of migrants out from this area.

The appearance of the communities has been described as part of the environment that "needs improvement". Related to this attitude is the observation that the median value of housing is well below that for the state as a whole. While the housing stock may consist of older homes, and of low dollar value, they are overwhelmingly owner-occupied single family dwelling units. Utah tends to have large families. This fact coupled with the older homes in the area is reflected in the statistics on overcrowding. Over 10 percent of the housing units had over one person per room in 1970. The state average is just under the rate observed for Millard County and is a full two percentage points above the national norm of 8.0 percent. The distribution of trailer houses is low constituting only 2.8 percent of the housing stock in 1970. This compares to approximately 10 percent for the community of Delta.

Based on objective indicators, law enforcement officials appear understaffed at a rate well below state and national averages. Looking at statistics on crime rates for Utah and specifically, rural Utah counties, it is revealed that violent crimes and crimes against property occur at rates which are exceptionally low, 1.5/1,000 population and 21.1/1,000 population respectively. Residents of Millard

county, however, while having a very low objective incidence of criminal activity, display a high degree of concern about law enforcement.

With respect to fire protection, there is evidence of both a low and high rating existing within the county. This reflects the fact that fire departments within the county are perceived as being of varying quality. Some communities give their fire department high ratings while others give theirs low ratings.

Crime rates are usually directly correlated with the level of social disorganization evident in a community. Indicators of social disorganization correlate positively with crime rate data as Millard County shows very low rates of divorce, suicide, and alcoholism. Suicide rates will not be discussed at the local level as they are calculated in terms of rate 1,000,000 population and in a small county the rate is too unstable to be a reliable statistic. Suicides are very rare here, however, as only one suicide is recorded between 1970 and 1976. District 4, which includes Millard County, had a rate of 9.4/1,000 population, well below the state and national averages. Alcoholism rates are estimated at 19.3/1,000 population, close to the state mean, but less than half the national alcoholism rate of 42/1,000 population. Divorces, reflecting the long term stability of families and high community cohesion in the area occur at an exceptionally low rate. The divorce rate in Millard County is 1.7/1,000 population, only one-third the state divorce rate of 5.1/1,000 population.

An understanding of the low ratings on variables reflecting social disorganization lies within local institutions providing community goods and services. In particular, "quality of religious life," "programs for aged," "schools" and "effectiveness of local government" are given exceptional ratings in terms of their adequacy and availability. These social and political service institutions provide the local population a high degree of integration and cohesion within the community stability. These high quality amenities are partially offset by the feeling that "facilities for youth," "shopping," "cultural activities," and "restaurants and entertainment" need improvement.

As indicated above, schools are evaluated by local residents as exceptional, indicating a very high level of satisfaction concerning their adequacy. Additional facilities for youth are evaluated as much less adequate. Based on objective indicators, the county educational institutions do not appear as exceptional. Apparently, their effectiveness is only partially determined by their pupil/teacher ratio of 23.4:1, slightly better than the state average of 24.8:1. Median school years completed at 12.4 is slightly less than the state and national average of 12.8 and 12.5, respectively. Nevertheless, this is a high level of education considering that Millard is a rural county with an older population distribution.

Recreation is available throughout the county on the large BLM landholdings and in Forest Service land along the eastern side of the county. Parks and playgrounds are evaluated as satisfactory by residents of the county, with some communities appearing to have better facilities than others. Access to the outdoors is viewed as exceptional in the area and was identified by residents as a major advantage of the physical environment in the Delta area.

In summary, the Delta region presents itself as an area with a high quality physical and social environment. It has experienced a slow pace of growth and social change. Its citizens indicate a high level of satisfaction with their way of life.

and are favorably disposed to a moderate pace of growth and industrial diversification.

ENERGY (I.1.9)

Delta has no natural gas service. Although no plans exist for extension of service to the area, if such service were to be provided the supplier would be Mountain Fuel Supply (MFS), Salt Lake City. Pacific Gas Transmission (PGT), a subsidiary of Pacific Gas and Electric, San Francisco, has proposed to build a 30-in. high pressure gas transmission line from Kemmerer, Wyoming, and Bonanza, Utah, joining east of Provo, Utah, near Strawberry Reservoir, and continuing along Interstate 15 through Cedar City, Utah, and Las Vegas, Nevada, to southern California. Delta is located approximately 26 mi west of the proposed pipeline route.

Home energy requirements are supplied by bottled gas, fuel oil and electricity. The fuels are trucked in from Las Vegas, Nevada, and Salt Lake City, Utah.

Electrical energy to Delta is supplied by Utah Power and Light Company via two 46 KV subtransmission lines.

TRAFFIC AND TRANSPORTATION (I.1.10)

The proposed base site is approximately 26 mi west of the community of Delta on U.S. Highway 59. This is the only major road near the site. Access to the proposed base site will be primarily along this route. Near the community of Delta a number of state and county roads cross the area. Figure I.1.10-1 is a schematic map showing the proposed site, the major roads in the area, and 1978 traffic volumes.

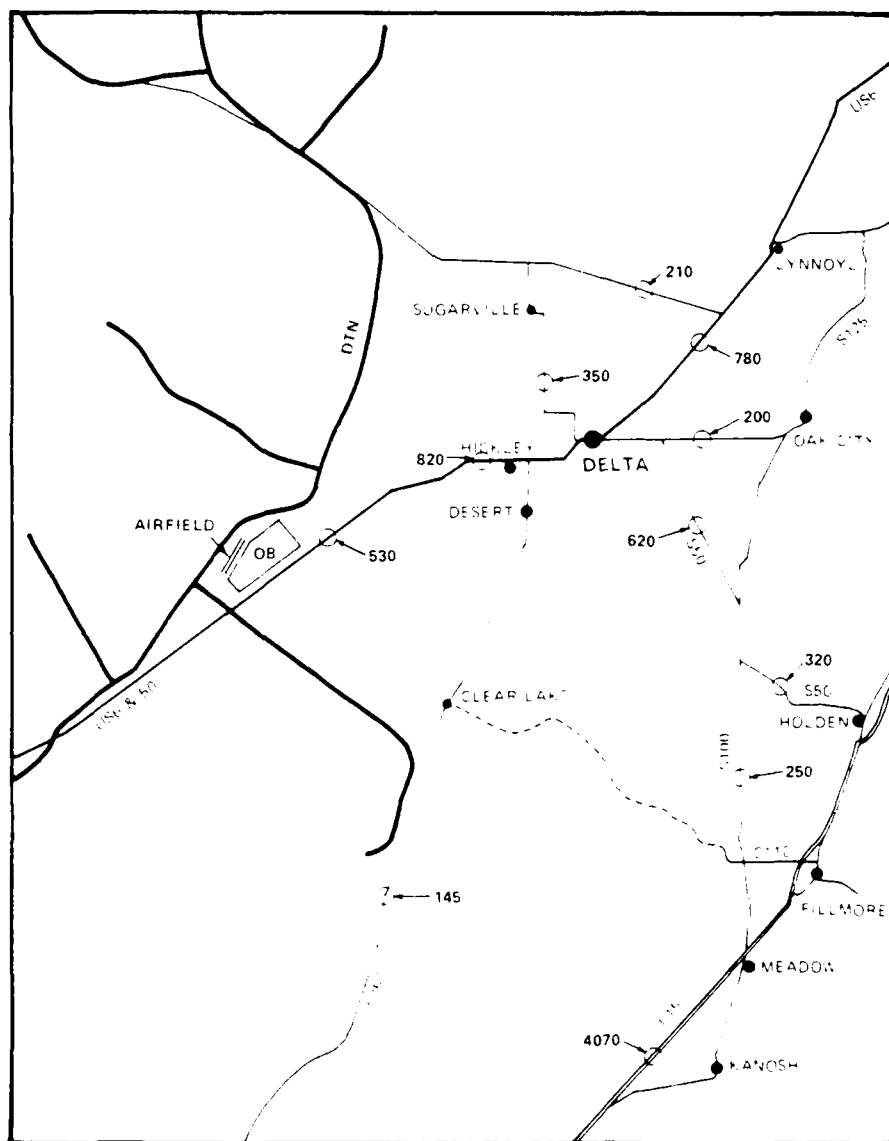
The average daily traffic during 1978 on U.S. 59 near the proposed site was 53%. Within the community of Delta traffic along U.S. 59 is considerably higher.

The proposed Inter Mountain Power Plant location is northwest of Delta near the community of Lyndahl. During construction of the plant a large number of construction workers will move into the area. Traffic will undoubtedly increase in the entire area as a result, but it is not likely that this will significantly affect traffic volumes near the base site itself. Traffic within Delta and other communities, especially to the northeast, will undoubtedly increase, however.

NATIVE AMERICANS (I.1.11)

Community Environment

The Delta area has potential cultural significance to three Utah Indian tribal groups: the Navajo, Shoshone, Western Ute, and Southern Paiute. Portions of the Sevier Desert north and west of the Delta area lie in the southeastern territory of the Goshutes, who reside at the Skull Valley and Goshute reservations. The extent of Goshute cultural resources in this area has not yet been determined. Two tribes from Western Utah, the Timpanogots and Pahvant, inhabited the Sevier Desert until their extermination in the 1850s. Timpanogots' villages are documented in Delta during the latter 19th century. The Pahvant inhabited



LEGEND 000 1978 TRAFFIC VOLUMES DELTA, UTAH

2180 4

SOURCE: UTAH DEPARTMENT OF TRANSPORTATION

Figure 1.1.10-1. Existing traffic volumes in the vicinity of Delta.

permanent settlements on the Sevier River, Beaver River, and on the adjacent flank of the Pahvant Mountains. Winter villages corresponding to major Pahvant divisions were located at Lynndyl, Deseret, Black Rock, Kanosh, Holden, and Scipio. Contemporary Southern Paiutes moved into the Sevier Desert basin after the emigration of the Utes to the Uintah Reservation in the 1850s and are now dominant in the area.

The Sevier Desert hydrologic unit contains 23 recorded aboriginal habitation sites and 54 springs. An intensive survey of this large area has not been conducted. Rock art sites are documented for the Sheeprock and Simpson Mountains in the northern portion of the unit, and for lava flow areas south of Delta. In addition, sensitive burial grounds occur in the Pahvant and Canyon Ranges east of Delta.

The discussion of Utah Southern Paiutes in Section 1.1.10 of ETR-6 (Beryl) and ETR-33 (Milford) is also applicable to Delta. In addition, the Skull Valley Reservation of Goshute Shoshones is 65 mi north of Delta. The reservation consists of 17,445 acres, and with an enrolled membership of 87, is economically depressed. Field investigations to gather site-specific data on the cultural resources and socioeconomic conditions of the Utah Southern Paiutes and Goshute Shoshones in the region are completed and the data are being analyzed.

Operating Base and Vicinity

There are no reservation lands or Native American communities in the immediate OB siting area. The Delta area has potential cultural significance to three Utah tribes: the Ute, Southern Paiute, and Goshute Shoshone. The area under consideration was occupied in late prehistoric and early historic times by the Pahvan Utes. The Pahvan inhabited permanent settlements along the Sevier River, Beaver River, and adjacent Pahvant Mountains. Winter villages corresponding to major Pahvant divisions were located at nearby Lynndyl and Deseret, as well as at Holden, Scipio, Kanosh, and Black Rock. Pahvant Ute cultural remains in the area are therefore extensive. Portions of the Sevier Desert and areas to the north and west of the Delta OB site lie in the southeastern territory of the Goshute Shoshone. This region appears to have been regularly shared by Utes and Goshutes in their respective hunting and gathering endeavors. Scattered archaeological remains of varying provinces are recorded north of the OB site location. Site-specific data on Native American cultural resources and socioeconomic environment gathered at the Kanosh and Richfield Indian Colonies and at the Skull Valley and Goshute Reservations are currently being analyzed.

ARCHAEOLOGICAL AND HISTORICAL RESOURCES (1.1.12)

There are no recorded archaeological or historical sites in the immediate OB vicinity, due in large measure to the lack of previous field survey. However, the proximity of the Sevier and Beaver rivers located immediately to the east of the OB suggests that the potential for cultural resources in this area is high. Scattered finds of fluted projectile points along the Sevier River attest to the possible presence of early man in this region, and Fremont sites are known in the general area.

Four National Register properties occur in the immediate vicinity of the Delta OB including Fort Deseret, the Gunnison Massacre site, the Topaz War Relocation

Center, and the PaleoIndian site, 42 MD 399. A high potential exists for the occurrence of other archaeological and historic sites eligible for the National Register of Historic Places. Some 11% known sites occur within the Sevier Desert hydrologic basin (Table 1.1.12.3), and within a 29 mi radius of the OB site approximately 30 percent of the land area is of moderate or high sensitivity.

Paleontology

The Delta OB siting area is located on alluvial valleyfill in an area that at one time was inundated by Lake Bonneville. Lake Bonneville was a large lake that covered much of the Utah Basin and Range during the late Pleistocene, up to about 10,000 years ago. Important vertebrate fossils have been found in scattered locations in the Bonneville sediments.

OTHER PROJECTS (1.1.13)

Economic Activity

Major anticipated activities in the county include the Intermountain Power Project (IPP), Continental Lime and Martin Marietta Cement Plants, and Precision Built Modular Home Manufacturing. IPP is expected to employ over 2,500 during the peak construction period. The other three anticipated projects are expected to create a total of about 500 jobs beginning in 1980 and continuing through 1994.

Table 1.1.13-1 presents employment projections over the 1980-1994 period for Millard County. These forecasts are separated into Baseline 1 and Baseline 2. The first set of projections are essentially an extrapolation of 1967-1978 growth trends in Millard County. Baseline 2 includes Baseline 1 plus the major anticipated projects described above. These projections, developed by the University of Utah's Bureau of Business and Economic Research (BEBR), forecast employment by place of residence and not place of work, as in Tables 1.1.1-1 and 1.1.1-2. In the case of Millard County, many persons working in the county live elsewhere, thereby reducing BEBR's employment figures. In comparison, to the 1977 employment figure of 3,416 presented in Tables 1.1.1-1 and 1.1.1-2, employment by place of residence for this same year was equal to 3,635 jobs (Utah Department of Employment Security, 1980). Employment by place of residence for 1978 and 1979 equalled 3,220 and 3,359 jobs, respectively. Forecasts for Baseline 1 show a drop in 1980 employment to 3,161, then a steady increase through 1994; an average annual growth is projected to equal 1.7 percent. The total number of jobs would increase by 858 over the 1980-1994 period. The Baseline 2 estimate for 1980 employment is 3,964, 803 jobs more than the Baseline 1 figure. Principally, the result of IPP, but also due to the other anticipated projects, Baseline 2 increases at an average annual rate of 17.1 percent between 1980 and 1985, reaching its peak of 8,717 jobs in 1985. During the next 5 years, county employment is expected to decrease by 3,310 jobs with average annual growth over the 1985-1990 period equalling -9.1 percent. This large reduction in employment marks the completion of construction of IPP. These projects in Millard County would very likely induce significant stress on the local economy as industries would attempt adjustment. Local labor shortages initially with surpluses in later years, wage inflation, initially, and in-migration of new workers in early forecast years with rapid out-migration later in key occupations would be likely events. After 1990, under Baseline 2, the county's employment is expected to return to positive growth, with 6.9 percent average annual growth rate over the period 1990-1994.

Table 1.1.12-1. Locations of known site types by topographic zones in the Sevier Desert basin.

SITE TYPE	TOPOGRAPHIC ZONE				
	INDETERMINATE	MOUNTAINS FOOTHILLS	DEEP BASIN	LOWER BASIN	VALLEY FLOOR
Indeterminate	33	1		1	1
Multiple Activity (e.g., habitations)	1			11	17
Special Purpose (e.g., rock art)	2	1	1	1	8
Limited Activity (e.g., campsites)	2	1	3	24	11
Isolated Finds	2	1	1	1	1
Total	77	2	3	38	34
Percent	100	3	4	49	44

3412-1

Table 1.1.13-1. Projected employment by major industrial sector, Millard County, 1980-1994.

MILLARD COUNTY	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Base Case 1															
Manufacturing	1,021	1,022	1,023	1,024	1,025	1,026	1,027	1,028	1,029	1,030	1,031	1,032	1,033	1,034	1,035
Mining	42	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Contract Construction	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Manufacturing	266	271	279	285	290	295	301	308	314	321	328	335	342	349	356
Transportation and Utilities	181	188	195	202	211	220	229	238	247	257	267	277	287	297	307
Wholesale and Retail Trade	541	541	541	542	543	544	545	546	547	548	549	550	551	552	553
Finance, Insurance, Real Estate	34	36	39	43	46	50	52	54	56	58	60	62	64	66	68
Services	234	247	262	276	293	311	329	348	367	387	407	427	447	467	487
Government	461	474	486	496	506	517	528	539	550	561	572	583	594	605	616
Non-Farm Proprietors	111	115	121	126	131	136	141	146	151	156	161	166	171	176	181
Total	3,084	3,134	3,196	3,263	3,336	3,413	3,495	3,582	3,674	3,771	3,873	3,980	4,092	4,209	4,331
Base Case 2															
Agriculture	1,021	1,022	1,023	1,025	1,026	1,028	1,029	1,030	1,031	1,032	1,033	1,034	1,035	1,036	1,037
Mining	73	71	73	74	75	76	77	78	79	80	81	82	83	84	85
Contract Construction	549	541	541	543	545	547	549	551	553	555	557	559	561	563	565
Manufacturing	272	278	289	296	303	310	317	324	331	338	345	352	359	366	373
Transportation and Utilities	194	203	215	223	235	241	248	255	262	269	276	283	290	297	304
Wholesale and Retail Trade	616	619	627	632	637	642	647	652	657	662	667	672	677	682	687
Finance, Insurance, Real Estate	46	47	49	51	53	55	57	59	61	63	65	67	69	71	73
Services	283	298	314	330	347	365	383	401	419	437	455	473	491	509	527
Government	704	710	716	721	726	731	736	741	746	751	756	761	766	771	776
Non-Farm Proprietors	135	145	153	160	167	174	181	188	195	202	209	216	223	230	237
Total	3,084	3,182	3,252	3,330	3,408	3,486	3,564	3,642	3,720	3,798	3,876	3,954	4,032	4,110	4,188

Source: Bureau of Business and Economic Research, University of Utah, 1986.

Population

Under the assumption that past trends continue into the future, Millard County will experience steady growth: the populations increasing from 8,915 in 1980 to 12,528 in 1994 giving an average annual growth rate of 2.5 percent. This is shown as Baseline 1 in Figure 1.1.13-1. Under the assumption that a number of construction projects reach fruition, growth can be expected to be much more rapid. See Baseline 2 in Figure 1.1.13-1. Over the period 1980-1983, the average annual rate of increase is 6.6 percent; from 1983-1985, it rises to 21.6 percent; for the period 1985-1988, it stabilizes at -0.7 percent; falls to -9.8 percent from 1988-1990; and then rises gradually at a rate of 1.0 percent from 1990-1994.

1.2 NATURAL ENVIRONMENT

BIOLOGICAL RESOURCES (1.2.1)

Vegetation

According to data acquired from the Bureau of Land Management (BLM), the immediate area considered for the potential OB site in the Delta area includes the following vegetation types: grassland, shadscale scrub, and alkali sink scrub. Figure 1.2.1-1 shows the candidate OB site with respect to major vegetation types that occupy areas large enough to be mapped at the given scale. The site is located north of the town of Delta, on the floor of the Sevier Desert. The general area is flat, with elevations ranging from 4,600 ft (1,400 m) to 4,900 ft (1,490 m). The vegetation types found in the larger area delineated by the Sevier Desert watershed boundary include, in addition to those listed above, Great Basin sagebrush, riparian woodland, and pinyon-juniper woodland. Some agricultural activity is also apparent.

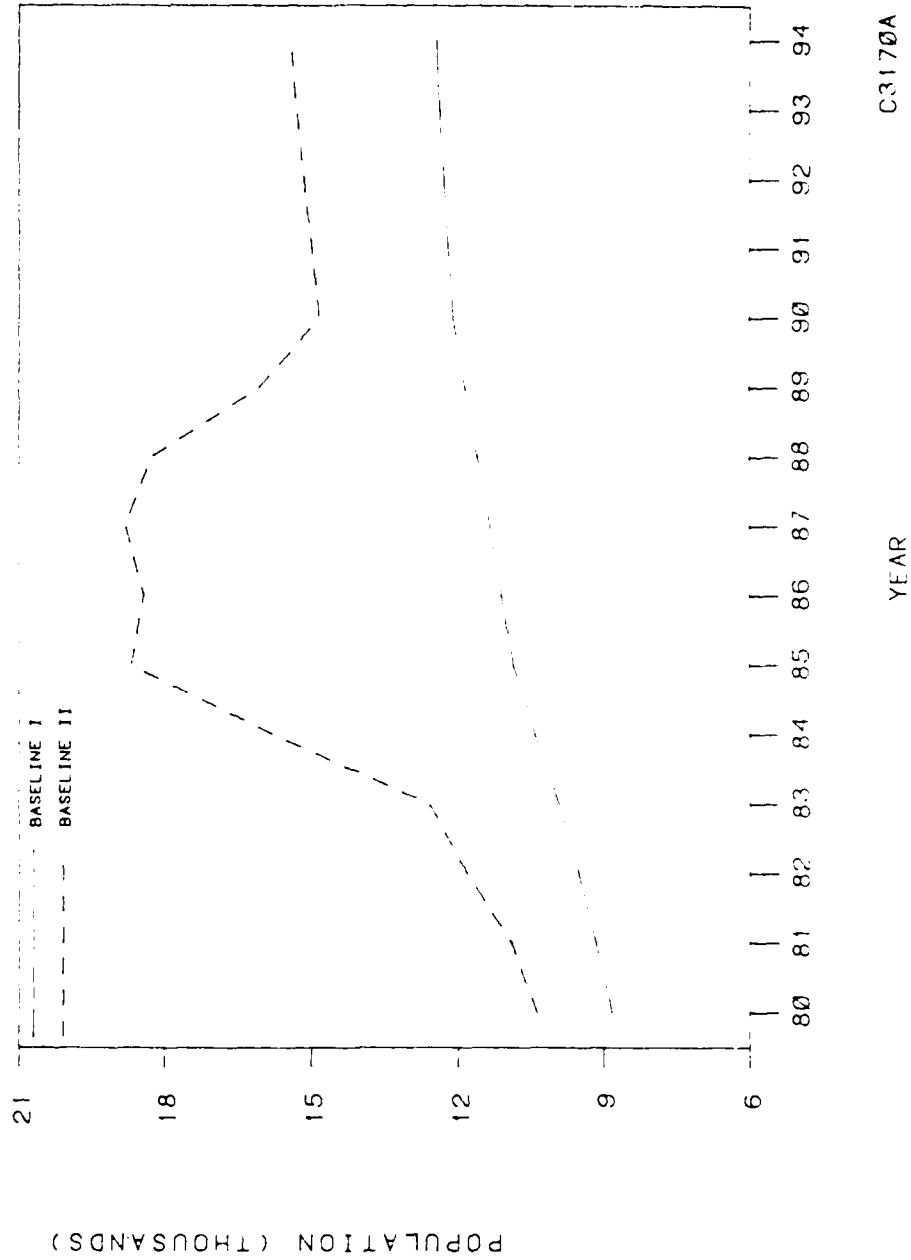
The BLM lists James' galleta grass (Hilaria jamesii), and alkali sacaton (Sporobolus airoides) as two species typical of grassland vegetation. Grassland stretches into an area of sand dunes, located within the proposed OB site. Horsebrush (Tetradymia sp.) is present in the area also.

Another vegetation type found at the potential OB site is shadscale, or saltbush scrub. This is the major vegetation type occurring in the Bonneville Basin area of Utah, which includes the OB site. The typical species here are shadscale (Atriplex confertifolia), and bud sage (Artemisia spinescens). Shadscale vegetation generally is low-growing, about one to one-and-a-half feet high, and consists of shallow-rooted plants and is often found on saline soils.

An area typified by sticky-leaved rabbitbrush (Chrysothamnus viscidiflorus), and horsebrush is found in the region just south of the grassland. The BLM uses the term "desert shrub" to describe this vegetation, considered by some to be an association of shadscale scrub. Rabbitbrush is a low plant, significant because of its ability to establish itself quickly in areas where soil has been disturbed (McArthur et al 1978).

Alkali sink scrub also occurs at the potential OB site. The characteristic species are greasewood (Sarcobatus vermiculatus), and green molly (Kochia americana). James' galleta grass (Hilaria jamesii) occurs in the northern sector, and greasewood predominates on the west side of the proposed OB site. Greasewood is

POPULATION PROJECTIONS, MILLARD COUNTY, 1980-1994



Source: Bureau of Economic and Business Research, University of Utah, September, 1988

Figure 1.1.13-1. Population projections for Millard County 1980 - 1994.

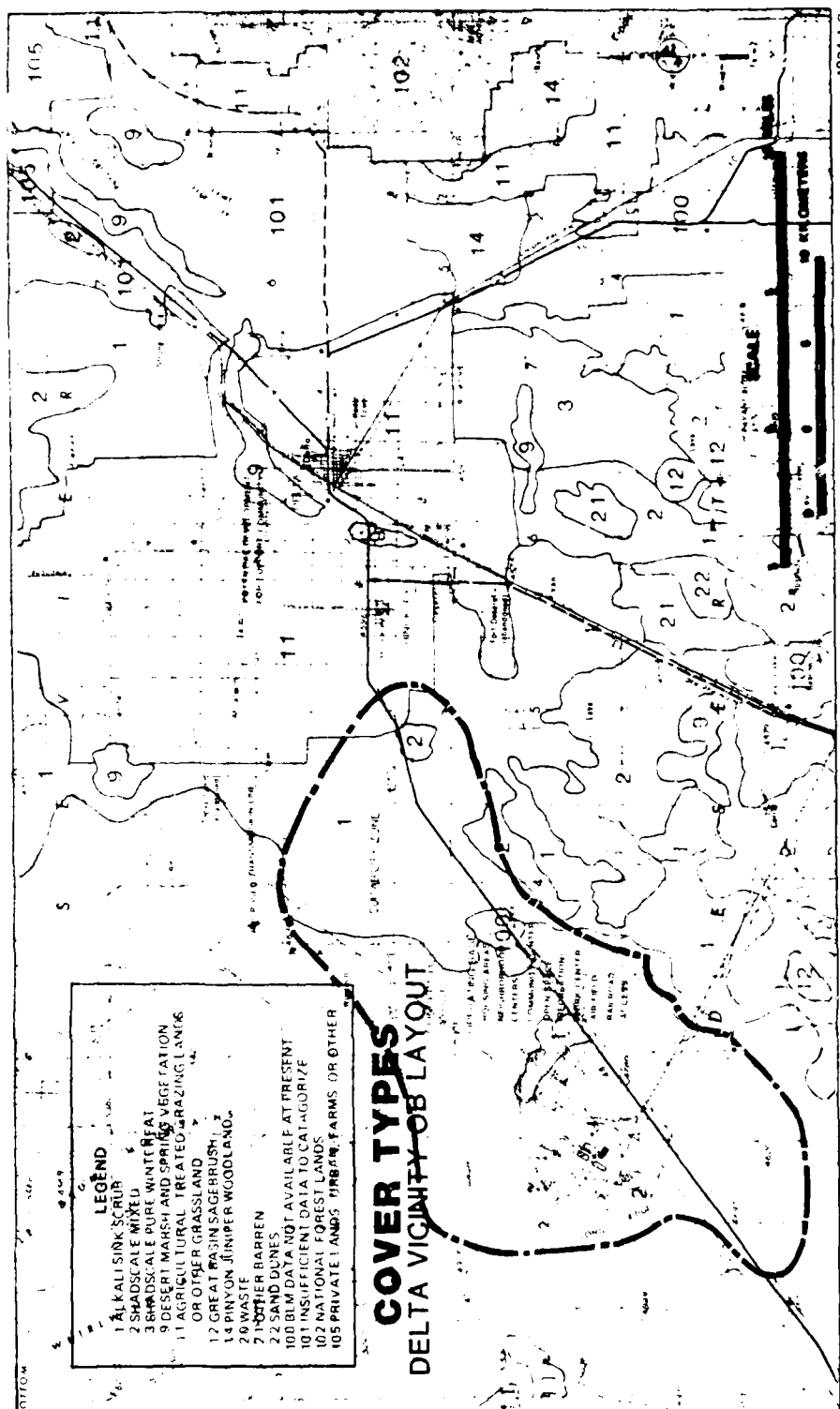


Figure 1.2.1-1. Vegetation cover types in the vicinity of Delta.

often found in moist low areas, since it can tolerate more soil moisture than shadscale (Atriplex confertifolia).

Alkali sink scrub and shadscale scrub are the most abundant vegetation types in the Sevier Desert watershed. These two vegetation types form a mosaic pattern across the majority of the valley bottom. The characteristic species which make up alkali sink scrub have been listed above. A general list of characteristic plants for shadscale scrub follows:

<u>Scientific Name</u>	<u>Common Name</u>
<u>Artemisia spinescens</u>	Budsage
<u>Atriplex canescens</u>	Four-wing saltbush
<u>Atriplex confertifolia</u>	Shadscale
<u>Chrysothamnus viscidiflorus</u>	Sticky-leaved horsebrush
<u>Eurotia lanata</u>	Winterfat
<u>Grayia spinosa</u>	Hop-sage
<u>Kochia americana</u>	Green Molly
<u>Tetradymia</u> spp.	Horsebrush

Winterfat often occurs in pure stands, for example, north of Clear Lake and in the area north of Kanosha. Shadscale also predominates in certain areas, especially in the southern portion of the watershed, east of the Cricket Mountains.

Various grassland areas occur in the Sevier Desert watershed. The BLM maps large "grass" types in the following areas: the marsh area surrounding Carr Lake; the marsh area surrounding Clear Lake; an area of about 10 mi² just west of the Beaver River and east of the Cricket Mountains; and one area near White Sage Flats, southwest of the town of Kanosh.

Great Basin sagebrush consists of low, silvery gray shrubs, two to seven feet tall. It occurs in the south-central portion of the watershed, on Tabernacle Hill and on the old lava flow area which is to the north of Tabernacle Hill. It is also found in the Cricket Mountains and the Swasey Mountains in the west, and in the northern section of the watershed. It is characterized by the following shrub dominants:

<u>Scientific Name</u>	<u>Common Name</u>
<u>Artemisia arbuscula</u>	Dwarf sagebrush
<u>Artemisia nova</u>	Black sagebrush
<u>Artemisia tridentata</u>	Big sagebrush
<u>Chrysothamnus viscidiflorus</u>	Sticky-leaved rabbitbrush
<u>Ephedra viridis</u>	Mormon tea
<u>Leptodactylon pungens</u>	Prickly phlox
<u>Tetradymia</u> sp.	Horsebrush

Black sagebrush generally occurs on steeper slopes with shallower soil. Big sagebrush, a larger shrub, is more often found in deep, moist soil.

The Sevier River contains surface water year-round, and riparian vegetation occurs along its banks. Cottonwoods (Populus fremontii), willows (Salix spp.), and tamarisk (Tamarix sp.) are the major trees associated with river areas.

Pinyon-juniper woodland occurs in the mountains and on high bajadas above the 5,500 ft (1,680 m) elevation level. It is a tree-dominated community dominated by 10-30 ft Utah juniper (Juniperus osteosperma), western juniper (J. occidentalis), and singleleaf pinyon (Pinus monophylla). The understory often consists of shrubs such as big sagebrush and antelope brush (Purshia tridentata).

Wildlife

Mule deer occur to the north in the Drum and Little Drum Mountains, to the west in the House Range, and to the south in the Cricket Mountains. Pronghorn antelope occur throughout much of the Sevier Desert and directly where this OB site is located. Major waterfowl areas are located at the Topaz State Waterfowl Management Area approximately 20 mi northeast and at Clear Lake State Waterfowl Management Area approximately 15 mi to the southeast.

Aquatic Species

The Sevier River and short streams in canyon drainages of the Pahvant and Canyon Mountains southeast of Delta contain game fish. Other game fishing opportunities for new residents of the Delta OB would be more than 30 mi (50 km) away from the proposed site.

Protected Species

No protected or proposed protected terrestrial animals occur in the immediate vicinity of the proposed site. The federally protected bald eagle winters in Rush Valley (a major wintering area) north of the base site and at the Fish Springs National Wildlife Refuge about 50 mi northwest of the proposed site. The wintering grounds closest to the site are about 20 mi east of this site in the area around Greenwood, Utah where many eagles were sighted in 1979. The peregrine falcon may nest in the Canyon Mountains, 30 mi east of the proposed site.

Four populations of the terrace buckwheat (Erigeron natum) are known to occur approximately 10 mi to the west of the OB site.

Wilderness and Significant Natural Areas

Recommended designated wilderness study areas and significant natural areas located within a 50 mi radius of the potential Delta OB site are listed below in Table 1.2.1-1.

SURFACE WATER (1.2.2)

Source

Delta is located in the Sevier Desert. The principal sources of surface water supply to the Sevier Desert are 1) inflow of the Sevier River (all of its water originates outside the basin) and 2) precipitation on the contiguous mountains, foothills, and alluvial fans above 4,800 ft. on the eastern and northern sides of the basin. The most important source of water originating within the basin is the snowpack in the mountains; the melt water sustains stream flow. Rain which falls erratically in short-term high intensity, summer thunderstorms, is the source of rapid runoff and flooding.

Table 1.2.1-1. Potential wilderness and significant natural areas within a 50-mi radius of the Delta site.

AREA	MILES FROM OB SITE
Potential Wilderness Areas	
1) Notch Peak	18
2) Howell Peak	21
3) King Top	50
4) Swasey Mountain	40
5) Fish Springs Range	37
Significant Natural Areas	
1) Antelope Springs Trilobite Beds	13
2) Clear Lake Wildlife Management Area	10
3) Topaz Wildlife Management Area	10
4) Fumarole Butte	24
5) Deer Habitat Management Area	40

2106-2

Streams

The Sevier and Beaver River originate outside the basin in the high plateaus to the east and southeast and terminate in the Sevier Desert. The Sevier River, which flows in close proximity to the City of Delta, enters the eastern side of the basin through Leamington Canyon and flows southwestward toward Sevier Lake. No perennial tributary streams reach the river within the Sevier Desert, although two, Oak Creek and the Beaver River, probably did before they were diverted for irrigation. Several perennial streams originate in the mountains surrounding the basin. As these streams flow into the basin, water from them percolates into the basin fill. There are several intermittent and ephemeral streams which seldom flow far beyond the mountain fronts because they seep into the alluvial fill.

Lakes and Reservoirs

River water reaches Sevier Lake only during periods of extremely high runoff because most of the flow is stored in reservoirs and used for irrigation. These reservoirs are Gunnison Bend Reservoir, less than 1.2 mi to the east of Delta, and DMAD reservoirs, about 5 mi to the northeast. Underflow from the Pahvant Valley discharges into Clear Lake, located approximately 31 mi south of Delta.

Dams and Canals

A system of dams and canals is used to store and direct water from the Sevier River for irrigation of small areas near Leamington and Lynndyl and a large area near Delta. The Central Utah Canal carries water along the east edge of the basin from the Sevier River into Pahvant Valley, to the southeast of Delta.

Drainage

The Sevier Desert, although appearing quite flat, slopes generally southwest toward the Sevier Lake playa. However, both perennial and intermittent streams percolate into the basin fill as they flow into the basin. Thus, water in the rivers reaches Sevier Lake only during periods of extremely high runoff.

Current Use

Except during periods of extremely high runoff, all of the river water is stored in reservoirs and diverted for irrigation. (A principal source of water for irrigation is the Sevier River).

Quality

The concentration of dissolved solids in the Sevier River is at least 1,000 ppm.

GROUNDWATER (1.2.3)

Movement

Water level contours indicate that groundwater in Sevier Desert proper is moving to an area of discharge 9-12 mi south and west of Delta. Small areas of movement in different directions exist in the northeast and northwest corners of the valley.

Groundwater withdrawal has caused small local changes in the groundwater surface (and hence direction of groundwater flow), but the regional configuration of the groundwater surface has been unaltered.

Natural Discharge

Groundwater in Sevier Desert is discharged primarily by subsurface flow and evapotranspiration. Subsurface flow is toward Sevier Lake playa where some groundwater is lost by evapotranspiration consuming between 1.7×10^8 and 2.2×10^8 acre feet every year. A small additional amount is discharged by seeps and springs.

Current Use

During 1964, about 1.3×10^9 cubic feet of water was pumped or flowed from wells in the Sevier Desert. Of this, 3.4×10^7 cubic meters was for irrigation, 4.2×10^7 cubic feet for domestic and stock supply, and about 2.1×10^7 cubic feet for public and industrial supply. Fugro (1980) reports that this increased to 50,000 af/yr or acre feet per year in 1977, of which 90 percent goes for irrigation.

Perennial yield has been estimated at 100,000 af/yr, but this includes surface flow as well as groundwater. Mower and Feltis (1968) estimate that of 100,000 af/yr, only about 23,000 af/yr are attributable to groundwater recharge.

Trends/Problems

Both quantity and quality of groundwater supply are future problems for Delta. As of 1968, groundwater withdrawal had only locally altered the water table levels; but discharge from flowing (artesian) wells had decreased partially as a result of drought and partly as a result of pumping the discharge, and water levels will continue to decrease as pumping continues.

The chemical quality of the groundwater around Delta is relatively fresh. The present groundwater local to Delta was seepage from the Sevier River some years ago. However, since irrigation has begun the quality of water in the Sevier River has degraded, and hence the quality of the recharge to the groundwater has also deteriorated. The groundwater is percolating from the Sevier River, beneath Delta and on the southwest, the freshwater being followed by the more saline post-irrigation water. Under hydraulic conditions as they existed in the mid-sixties, water containing 1,000 ppm of dissolved solids could be expected to reach the Delta area in 100-150 years. If the rate of pumping were substantially increased, the hydraulic gradient would become steeper and the saline water would arrive at Delta sooner.

The chemical quality of the groundwater ranges widely throughout the basin. The freshest water is presently found near Delta, where the dissolved solids content (as of 1968) was only about 250 ppm. Mower and Feltis (1968) reported that groundwater quality in the Sevier Desert is generally poor except near Delta.

SOILS/SLOPE (1.2.4)

The soils of the potential OB southwest of Delta formed on lake plains and terraces with slopes generally 0 to 2 percent. Plavas are found throughout this area

and the soils are generally deep, well-drained, strongly to very strongly saline and moderately to very strongly alkaline. Surface textures range from silt loams to gravelly silt loams and runoff is slow to medium. These soils are presently used primarily for range, although they are potentially arable if water becomes available for leaching and irrigation. At the present, the water availability to plants is low due to the very high salt concentrations.

Several soil series are found in this region. Soils of the Uvada series predominate and have a surface horizon of light-gray silt loam underlain by horizons of silty clay loam, silty clay loam, silty clay and silt loam to depths of over 65 inches (U.S.D.A. Soil Conservation Service, May 1977). Salt content of the Uvada soils ranges from 9.65 percent to over 2.0 percent. Permeability is very slow, runoff is slow and the hazard of erosion is slight.

Soils of the Goshute and Curdli series also occur in the Delta OB site. Goshute soils have a light-gray gravelly silt loam surface underlain by horizons of silty clay loam and fine gravel to over 60 in. (150 cm). Permeability is moderately slow to the fine gravel at 18 in. (46 cm) where it then becomes very rapid. Runoff is medium and the hazard of erosion is moderate. The Curdli soils have a white loam surface underlain by horizons of loam and heavy silt loam to greater than 60 in. (150 cm). Permeability is moderate, runoff is slow and the erosion hazard is slight.

General engineering properties of the soils of this area include a high potential frost action, low to medium shear strength and medium compressibility.

Seismicity

There is a seismic zone along Wasatch Front (separating the Basin and Range Province from the Colorado Plateau), some 20 mi east of Delta. The Wasatch Front is a recurrent belt of earthquake activity. Tremors have a relatively high order of periodicity, albeit seldom exceed 3.2 Richter magnitude. An unexpected jolt in the particular part of the Wasatch fault zone could range to a credible earthquake of 5.5 Richter, requiring a design taking 0.59 of ground motion.

AIR QUALITY (1.2.5)

Particulate and gaseous emissions data for Millard County are given in Table 1.2.5-1. Particulate emissions in 1977 were reported as 4,541 tons per year, without windblown fugitive dust. No air quality monitoring data exists for Delta. There are no Class I areas within 100 mi of the Delta operating base site.

There is little to distinguish the climatology of Delta from the Milford operating base site. Precipitation of 7.16 in. annually continues to be well distributed throughout the year with little effect on visible dust frequency.

Table 1.2.5-1. Total emissions and emission density levels of alternative potential OB locations.

Pollutant Emission Unit (Metric)	City, Metric	Emissions, Metric Tons					City, Metric
		1990	1991	1992	1993	1994	
Total Particulate, emissions Tons/yr	12,000	11,000	10,000	9,000	8,000	10,000	
Particulate, density Tons/yr mi ²	0.04	0.03	0.03	0.03	0.03	0.03	
Total SO _x emissions Tons/yr	200,000	180,000	160,000	140,000	120,000	150,000	
SO _x density Tons/yr mi ²	0.006	0.005	0.005	0.004	0.004	0.005	
Total NO _x emissions Tons/yr	12,000	11,000	10,000	9,000	8,000	10,000	
NO _x density Tons/yr mi ²	0.0004	0.0003	0.0003	0.0003	0.0003	0.0004	
Total Hydrocarbon emissions Tons/yr	1,000	900	800	700	600	800	
Hydrocarbon density Tons/yr mi ²	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	
Total emissions Tons/yr	200,000	180,000	160,000	140,000	120,000	150,000	
Density Tons/yr mi ²	0.006	0.005	0.005	0.004	0.004	0.005	

Figure 1. The effect of the number of trials on the mean number of correct responses. The number of correct responses was significantly higher for the 10 trials condition than for the 5 trials condition, $F(1, 15) = 10.00, p < 0.05$. Error bars represent the standard error of the mean.

[illegible][illegible]

2.0 ENVIRONMENTAL CONSEQUENCES FOR THE OPERATING BASE VICINITY

2.1 HUMAN ENVIRONMENT

EFFECTS ON EMPLOYMENT AND LABOR FORCE (2.1.1)

Delta would be the location of a second operating base under Alternative 2. Base-associated employment in Millard County for this alternative, as well as employment related to construction of DDA facilities under all alternatives, would significantly change the size and structure of the small, agriculture-dominated local economy.

Direct, Indirect and Total M-X Related Employment

Employment effects primarily result from the project's demand for construction and operations labor. Table 2.1.1-1 presents direct, indirect and total labor requirements in Millard County for Alternative 2 and DDA construction projected for all full deployment options in Nevada/Utah. Construction of DDA facilities is projected to begin in 1984, run five years, and peak at 2,700 jobs in 1988. Base construction is scheduled concurrently, but peaks one year earlier, at 2,100 jobs.

Compared to trend growth employment projections developed by the Bureau of Economic and Business Research, University of Utah, the combined peak construction labor demand of 4,200 persons in 1988 would be 70 times projected employment of 60 jobs in the contract construction industry, and roughly 110 percent of total baseline employment in that year (University of Utah, BEBR, October 1980). Employment demand of this scale would create significant short-run stress in the county's building trades industry, inducing skilled labor shortages, wage inflation and large scale in-migration of workers into Millard County.

Cumulative employment impacts from other projects could exacerbate growth stress in construction sectors in the county, though it also would imply a larger local labor supply for potential M-X-related employment. In particular, the Intermountain Power Project (IPP) is scheduled to be constructed in the county over the same period as M-X. Including IPP and other smaller projects, Baseline 2 employment in 1988 would be 8,500 jobs. Peak construction demand impacts represent about 50 percent of Baseline 2 employment in 1988.

Operation of the base would begin in 1986, with initial staffing of 1,400 persons. The base would be fully operational by 1989. Table 2.1.1-1 indicates that long-run direct employment in Millard County would equal 5,700 jobs, 80 percent of which would be military personnel.

Indirect employment would begin in 1984, peak at 4,450 jobs in 1988, and decline thereafter until it reaches a long-run level of 1,200 jobs in 1992. The principal source of indirect employment is the respending of project payrolls earned by direct employees in the county. There also would be local procurement of goods and services from area suppliers, requiring additional employment expansion to meet the increased demand. Project-related investments by local, state and federal governments and private businesses also would create additional short-run indirect employment.

Table 2.1.1-1.

M-X RELATED SYSTEM EMPLOYMENT BY PLACE OF EMPLOYMENT, IN MILLARD

ALTERNATIVE 2 FULL DEPLOYMENT - NEVADA/UTAH
 BASE I AT COYOTE SPRINGS, NV (CLARK CO)
 BASE II AT DELTA, UT (MILLARD CO)

TYPE OF EMPLOYMENT	NUMBER OF JOBS													
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
TECHNICAL FACILITIES														
CONSTRUCTION	0	0	550	1800	1350	1500	2700	1050	0	0	0	0	0	
ASSEMBLY + CONSTRUCT	0	0	20	370	290	350	730	800	0	0	0	0	0	
BASE														
CONSTRUCTION	0	0	0	200	1350	2050	1450	750	0	0	0	0	0	
ASSEMBLY AND CHECKOUT	0	0	0	0	0	0	0	0	0	0	0	0	0	
OPERATIONS														
OFFICERS	0	0	0	0	100	200	350	450	450	450	450	450	450	
ENLISTED PERSONNEL	0	0	0	0	1100	2700	3250	4400	4400	4400	4400	4400	4400	
CIVILIANS	0	0	0	0	200	400	650	850	850	850	850	850	850	
TOTAL DIRECT	0	0	570	2370	4390	6700	9130	8300	5700	5700	5700	5700	5700	
INDIRECT	0	0	499	1484	2957	4320	4422	3786	2654	1464	1190	1179	1179	
TOTAL	0	0	1069	3854	7342	11020	13552	12086	8354	7164	6890	6879	6879	

SOURCE: HDR SCIENCES. 31-OCT-80

SOURCE: HDR SCIENCES, 31-OCT-80

Table 2.1.1-1 indicates that peak employment by place of work could reach 13,600 jobs in 1988, about 300 percent of trend growth employment projections of 4,500 jobs, and almost 200 percent of Baseline 2 jobs in that year. However, an equally important measure of local impacts would be employment change by place of residence, i.e., adjusting employment for cross-county commuting. In the case of Millard County, the peak figure of 13,600 workers given above adjusts downward to 12,400 jobs, assuming that many employed on the project could live in adjacent Juab and Beaver counties. Total employment by place of work stabilizes by 1992 at 6,900 jobs, roughly 150 percent of Baseline 1 employment of 4,800 jobs in 1992 and about 120 percent of projected Baseline 2 employment. These projections assume that, in the long-run, virtually all county M-X-related job-holders would reside within Millard County.

Delta and a number of small communities would likely experience much of the local growth stress. The county economy has been characterized by the dominance of the agricultural and government sectors, with other industries, e.g., manufacturing, services and construction having been relatively unimportant (Bureau of Economic Analysis, April 1979). Having historically experienced modest employment growth of 1.5 percent per year over the 1967-1977 period, the very rapid buildup of employment in the county would create significant economic dislocations. These would include wage and price inflation, and shortages in key occupations. Growth of ancillary industries to supply consumption demands and base procurement needs would change the county's economic structure.

Labor Force Impacts

Local labor markets would become very tight, especially over the buildup phases in the county. This problem would be particularly acute for the construction trades. In such a relatively small labor market, significant in-migration of construction and operations personnel would be required. Some indirectly employed workers also would in-migrate from outside the county. Tables 2.1.1-2 and 2.1.1-3 present labor in-migration estimates for Millard County under Alternative 2 for Baselines 1 and 2, respectively. These figures are critical, since they form the basis for civilian M-X-related population growth, and, in conjunction with in-migration of military personnel and dependents, determine key impacts on local infrastructure, services, and government finance. Estimates of total civilian M-X-related employment in the tables are derived from direct and indirect labor demand projections presented in Table 2.1.1-1, after adjustment for cross-county commuting. This figure peaks at 9,000 workers in 1988.

In the same year, Millard County's available resident labor force is forecast to equal about 80 persons under Baseline 1 and 130 persons under Baseline 2. This "without M-X" projection represents an estimate of the future unemployed labor force less those persons who would likely remain unemployed even in extremely tight labor markets.

The "net civilian labor force impact" then compares the expected available labor pool in Millard County with M-X demand for civilian labor. It constitutes cumulative civilian labor in-migration into the county, and in 1988 would equal about 9,200 workers. In other words, up to and including 1988, a net total of 9,200 civilian workers would become new residents of the county. Tables 2.1.1-2 and 2.1.1-3 indicate rapid out-migration after 1988 as job opportunities in the county diminish;

Table 2.1.1-2.

TOTAL CIVILIAN M-X RELATED EMPLOYMENT, AVAILABLE RESIDENT LABOR FORCE,
AND NET CIVILIAN LABOR FORCE IMPACT BY PLACE OF RESIDENCE
FOR MILLARD

ALTERNATIVE 2, FULL DEPLOYMENT - NEVADA/UTAH
BASE I AT COYOTE SPRINGS, NV (CLARK CO.)
BASE II AT DELTA, UT (MILLARD CO.)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TOTAL CIVILIAN M-X-RELATED EMPLOYMENT	0	0	969	3516	5705	7962	8987	6716	3419	2259	1955	1943	1943
AVAILABLE RESIDENT LABOR FORCE	82	88	110	130	128	131	127	112	103	104	105	106	107
NET CIVILIAN LABOR FORCE IMPACT	0	0	916	3550	5788	8119	9198	6807	3436	2246	2237	2236	2236

SOURCE: HDR SCIENCES, 31-OCT-80

Table 2.1.1-3.

TOTAL CIVILIAN M-X RELATED EMPLOYMENT, AVAILABLE RESIDENT LABOR FORCE,
AND NET CIVILIAN LABOR FORCE IMPACT BY PLACE OF RESIDENCE
FOR MILLARD

ALTERNATIVE 2, FULL DEPLOYMENT - NEVADA/UTAH (L)
BASE I AT COYOTE SPRINGS, NV (CLARK CO.)
BASE II AT DELTA, UT (MILLARD CO.)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TOTAL CIVILIAN M-X-RELATED EMPLOYMENT	0	0	969	3516	5705	7962	8987	6716	3419	2259	1955	1943	1943
AVAILABLE RESIDENT LABOR FORCE	86	89	72	76	77	79	81	83	84	85	86	86	87
NET CIVILIAN LABOR FORCE IMPACT	0	0	947	3595	5840	8173	9246	6837	3450	2260	2243	2243	2243

SOURCE: HDR SCIENCES, 31-OCT-80

"net civilian labor force impacts" decline. This figure stabilizes at 2,200 persons by 1991, and this is the estimated total civilian worker in-migration into Millard County under Alternative 2. Total labor in-migration would include military, and in 1991, would equal about 7,100 persons.

Following peak in-migration, labor market stress would decline somewhat, unemployment rates could increase, and project-induced differentials between construction wages and earnings in other sectors would begin to decline. Occupational transition also would occur, out of short-run, boom-growth industries, and into the service and trade sectors associated with continued operation of the base.

EFFECTS ON INCOME AND EARNINGS (2.1.2)

Earnings impacts in Millard County are closely related to employment effects discussed in Section 2.1.1. Table 2.1.2-1 presents M-X-related earnings place of work for Alternative 2, where Delta would be the location of a second operating base and DDA facilities would be sited in the county. The table indicates that peak earnings under this alternative would equal about \$274 million in 1988, almost 70 times the level of 1978 earnings of \$39 million (1980 dollars) in the county. Of this increase, almost one-half would be attributable DDA construction and associated indirect employment, hence would be felt in the county under all project alternatives, including split deployment. The table indicates that as employment declines to operational levels and the mix of occupations shifts from construction to primarily military and civilian base employees, project related earnings would decline to \$94 million in 1991. This figure is still more than twice 1978 baseline earnings. Thus, in an economy characterized by heavy dependence on agriculture and government and little real earnings growth (1.9 percent per year over the 1967-1977 period), earnings generated by M-X would create significant boom-type stress.

EFFECTS ON PUBLIC FINANCE (2.1.3)

This section presents the aggregate expenditures, revenues, and net impacts estimated for all local governments in Millard County. Peak year and long-term capital expenditure impacts also are presented. However, the effects discussed reflect aggregate levels and cannot be interpreted as estimates associated with a specific jurisdiction. Effects specific to the local school district constitute a major portion of these effects and are presented separately.

The net fiscal impact in the Millard County area is largest under Alternative 2 where Operating Base II is proposed for the area. Peak year (1987) deficits under this alternative amount to approximately \$2.2 million (Table 2.1.3-1). Serious service level degradation could occur if timely receipt of outside aid and/or mitigative strategies are not available. Although long-term effects (1992 - 1994) indicate minor problems in raising the monies necessary to meet anticipated expenditures during these years, excess revenues available from the previous three years can more than offset any potential adverse long-term effects. Under the remaining alternatives the initial population in-migration anticipated in the early years of the project results in significant short-term deficits of approximately \$900,000 in the peak year 1985 under the Proposed Action and Alternatives 1, 3, 4, 5, and 6. Slightly larger deficits (\$1.2 million) are estimated under Alternative 8 in the peak year 1985. In all cases these effects are temporary in nature yet would still require significant levels of outside aid if service levels are not to deteriorate to unacceptable levels.

Table 2.1.2-1.

M & RELATED EARNINGS, IN MILLIONS OF FY 1980 DOLLARS, IN MILLARD
 ALTERNATIVE 2, FULL DEPLOYMENT - NEVADA/UTAH
 BASE 1 AT COYOTE SPRINGS, NV (CLARK CO.)
 BASE 11 AT DELTA, UT (MILLARD CO.)

SOURCE OF EARNINGS	1980	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLUSTER FACILITIES CONSTRUCTION, ASSEMBLY AND CHECKOUT	0.0	0.0	12.0	69.7	52.6	59.2	102.0	55.7	0.0	0.0	0.0	0.0	0.0
BASE CONSTRUCTION, ASSEMBLY, AND CHECKOUT	0.0	0.0	0.0	6.7	45.4	68.9	48.7	25.2	0.0	0.0	0.0	0.0	0.0
OPERATIONS	0.0	0.0	0.0	0.0	19.1	38.1	58.9	78.5	78.5	78.5	78.5	78.5	78.5
INDIRECT	0.0	0.0	6.5	19.3	38.4	56.2	57.5	49.2	34.5	19.0	13.5	15.3	15.3
TOTAL	0.0	0.0	25.5	95.7	155.4	222.3	274.1	208.2	113.0	97.6	94.0	93.8	93.8

SOURCE: MOR SCIENCES, 31-OCT-80

Table 2.1.3-1. (Page 1 of 2)

		1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
LOCAL GOVERNMENT REVENUES, EXPENDITURES, AND NET IMPACTS (THOUSANDS FY 1990 \$) (1) BASELINE (10)														
CITY MILWAUKEE														
UNIMPROVED ACTION														
REVENUES														
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PCT DIFF		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES														
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PCT DIFF		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT		0	0	0	0	0	0	0	0	0	0	0	0	0
ALTERNATIVE 1														
REVENUES														
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PCT DIFF		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES														
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PCT DIFF		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT		0	0	0	0	0	0	0	0	0	0	0	0	0
ALTERNATIVE 2														
REVENUES														
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PCT DIFF		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES														
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
WITHIN MX	B275	8624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734	10790	10790
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0
PCT DIFF		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT		0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2.1.3-1. (Page 2 of 2)

ALTERNATIVE 4												
REVENUES												
WITHOUT MX	B275	B624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734
WITH MX	B275	B624	9599	11736	12277	12607	12970	13262	13592	13681	13761	13834
DIFFERENCE	0	0	592	2313	2637	2600	2700	2862	432	0	0	0
PCI DIFF	0.00	0.00	6.37	24.72	27.37	26.04	28.04	29.31	4.22	0.00	0.00	0.00
EXPENDITURES												
WITHOUT MX	B275	B624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734
WITH MX	B275	B624	9910	12628	12446	13014	14070	12188	10376	10667	10747	10820
DIFFERENCE	0	0	903	3205	2406	3168	4008	1912	86	86	86	86
PCI DIFF	0.00	0.00	10.02	34.02	29.11	32.17	47.79	18.61	0.02	0.01	0.01	0.02
MX INJECTED	0	0	0	0	0	0	0	0	0	0	0	0
NET IMPACT	0	0	311	602	143	361	373	565	447	0	0	0
ALTERNATIVE 5												
REVENUES												
WITHOUT MX	B275	B624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734
WITH MX	B275	B624	9599	11736	12277	12607	12970	13262	13592	13681	13761	13834
DIFFERENCE	0	0	592	2313	2637	2600	2700	2862	432	0	0	0
PCI DIFF	0.00	0.00	6.37	24.72	27.37	26.04	28.04	29.31	5.07	0.03	0.03	0.03
EXPENDITURES												
WITHOUT MX	B275	B624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734
WITH MX	B275	B624	9910	12628	12446	13014	14070	12188	10376	10667	10747	10820
DIFFERENCE	0	0	903	3205	2406	3168	4008	1912	86	86	86	86
PCI DIFF	0.00	0.00	10.02	34.02	29.11	32.17	47.79	18.61	0.02	0.01	0.01	0.02
MX INJECTED	0	0	0	0	0	0	0	0	0	0	0	0
NET IMPACT	0	0	311	602	143	361	373	565	447	0	0	0
ALTERNATIVE 6												
REVENUES												
WITHOUT MX	B275	B624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734
WITH MX	B275	B624	9599	11736	12277	12607	12970	13262	13592	13681	13761	13834
DIFFERENCE	0	0	592	2313	2637	2600	2700	2862	432	0	0	0
PCI DIFF	0.00	0.00	6.37	24.72	27.37	26.04	28.04	29.31	5.07	0.03	0.03	0.03
EXPENDITURES												
WITHOUT MX	B275	B624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734
WITH MX	B275	B624	9910	12628	12446	13014	14070	12188	10376	10667	10747	10820
DIFFERENCE	0	0	903	3205	2406	3168	4008	1912	86	86	86	86
PCI DIFF	0.00	0.00	10.02	34.02	29.11	32.17	47.79	18.61	0.02	0.01	0.01	0.02
MX INJECTED	0	0	0	0	0	0	0	0	0	0	0	0
NET IMPACT	0	0	311	602	143	361	373	565	447	0	0	0
ALTERNATIVE 8A												
REVENUES												
WITHOUT MX	B275	B624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734
WITH MX	B275	B624	9419	10537	10825	11027	11231	11435	11639	11728	11808	11888
DIFFERENCE	0	0	411	1114	1185	1181	1169	1159	1149	1147	1147	1154
PCI DIFF	0.00	0.00	4.37	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EXPENDITURES												
WITHOUT MX	B275	B624	9007	9423	9640	9846	10062	10276	10490	10581	10661	10734
WITH MX	B275	B624	9419	10537	10825	11027	11231	11435	11639	11728	11808	11888
DIFFERENCE	0	0	411	1114	1185	1181	1169	1159	1149	1147	1147	1154
PCI DIFF	0.00	0.00	4.37	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
MX INJECTED	0	0	0	0	0	0	0	0	0	0	0	0
NET IMPACT	0	0	311	602	143	361	373	565	447	0	0	0

SOURCE: URBAN SCENARIOS
 *PCI ESTIMATES REFLECT AGGREGATE REVENUES AND EXPENDITURES FOR ALL LOCAL GOVERNMENT UNITS CONTAINED WITHIN SCENARIOS
 **DIFFERENCE: OFFICIAL DISCREPANCY BETWEEN THE SCENARIOS

The effects on the local school district exhibit similar patterns. Maximum impacts are experienced under Alternative 2 where an approximately \$600,000 deficit is anticipated by 1985 - 1986. This situation could adversely affect service levels in the schools if mitigative measures and/or timely outside aid is not made available. No adverse long-term effects are anticipated under any of the alternatives (Table 2.1.3-2).

Capital expenditure requirements for the Proposed Action, Alternatives 1 through 6, and Alternative 8 are presented for the Millard County area in Table 2.1.3-3. Total long-term capital expenditures are greatest under Alternative 2 and amount to approximately \$25.9 million. Under Alternative 2, school expenditures account for 67 percent of total capital outlays in the long term. Under the remaining alternatives, long-term capital expenditure requirements are substantially less.

The level of capital expenditure requirements estimated in the Beaver County area when compared to the reserved bonding capacities of the various jurisdictions indicates the inability of the local jurisdictions to finance the projects necessary to support these levels of infrastructure growth. The relatively low tax base in the Millard County area will prevent any financing of large-scale infrastructure facilities. The importance of having the infrastructure facilities operative before the levels of population in-migration reach their peak levels cannot be over-emphasized. Federal assistance is necessary to maintain anticipated service levels demands. While peak year capital expenditure requirements are higher, temporary facilities and mitigation strategies can reduce the costs. Partial local financing of long-term requirements will be possible, although federal assistance would be required to mitigate the adverse short-term impacts.

The fiscal effects associated with the high baseline assumptions under each type of analysis are shown in Tables 2.1.3-4 through 2.1.3-6.

EFFECTS ON POPULATION AND COMMUNITIES (2.1.4)

The population effects of a second operating base near Delta, Utah, which is proposed in Alternative 2, are projected to occur primarily within Millard County, although small additional effects would be experienced in adjacent Juab and Beaver Counties. The M-X-related in-migrant population generated in Millard County by the second operating base is projected to reach a maximum during the construction "boom" of about 24,000 persons in 1988, an increase of more than 200 percent over the trend-growth baseline population projected that year, as shown in Table 2.1.4-1. If the effects of other concurrent projects are added to those of M-X, a total of 30,600 in-migrants would be present in the county in 1988, an increase of 262 percent over the trend-growth projection. Over the five year M-X construction boom period, Millard County's growth rate would increase to 19 percent annually and to 27 percent with other concurrent projects, compared to a trend growth rate of 2.5 percent. In the long-term out-migration of construction related population would reduce the total to about 13,700 by 1992, over 100 percent above the trend growth baseline. With the effects of other projects added to M-X, the total long-term in-migration would be about 16,600, an increase of 133 percent over the trend baseline.

The construction-related population projected to be present in the county would total about 9,000 persons in the peak year (1988), about 37 percent of all

[illegible]

	Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000
--	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Table 2.1.3-2. (Page 2 of 2)

ALTERNATIVE 4													
REVENUES													
WITHIN MY	5109	5325	5561	5010	5932	6079	6212	6145	6476	6531	6582	6627	6662
DIFFERENCE	5109	5325	5561	5010	5932	6079	6212	6145	6476	6531	6582	6627	6662
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES													
WITHIN MY	5131	5360	5607	5065	6000	6129	6263	6397	6530	6586	6636	6682	6717
DIFFERENCE	5131	5360	5607	5065	6000	6129	6263	6397	6530	6586	6636	6682	6717
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT	0	0	100	414	201	41	106	747	410	0	0	0	0
ALTERNATIVE 5													
REVENUES													
WITHIN MY	5109	5325	5561	5010	5932	6079	6212	6345	6476	6513	6582	6627	6662
DIFFERENCE	5109	5325	5561	5010	5932	6079	6212	6345	6476	6513	6582	6627	6662
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES													
WITHIN MY	5131	5360	5607	5065	6000	6129	6263	6397	6530	6586	6636	6682	6717
DIFFERENCE	5131	5360	5607	5065	6000	6129	6263	6397	6530	6586	6636	6682	6717
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT	0	0	100	414	201	41	181	777	426	16	16	16	15
ALTERNATIVE 6													
REVENUES													
WITHIN MY	5109	5325	5561	5010	5932	6079	6212	6345	6476	6513	6582	6627	6662
DIFFERENCE	5109	5325	5561	5010	5932	6079	6212	6345	6476	6513	6582	6627	6662
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES													
WITHIN MY	5131	5360	5607	5065	6000	6129	6263	6397	6530	6586	6636	6682	6717
DIFFERENCE	5131	5360	5607	5065	6000	6129	6263	6397	6530	6586	6636	6682	6717
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT	0	0	100	414	201	41	181	777	426	16	16	16	15

NOTE: 1. 100% = 1.0000. 2. 0.00 = 0.0000. 3. 0.00 = 0.0000. 4. 0.00 = 0.0000. 5. 0.00 = 0.0000. 6. 0.00 = 0.0000. 7. 0.00 = 0.0000. 8. 0.00 = 0.0000. 9. 0.00 = 0.0000. 10. 0.00 = 0.0000. 11. 0.00 = 0.0000. 12. 0.00 = 0.0000. 13. 0.00 = 0.0000. 14. 0.00 = 0.0000. 15. 0.00 = 0.0000. 16. 0.00 = 0.0000. 17. 0.00 = 0.0000. 18. 0.00 = 0.0000. 19. 0.00 = 0.0000. 20. 0.00 = 0.0000. 21. 0.00 = 0.0000. 22. 0.00 = 0.0000. 23. 0.00 = 0.0000. 24. 0.00 = 0.0000. 25. 0.00 = 0.0000. 26. 0.00 = 0.0000. 27. 0.00 = 0.0000. 28. 0.00 = 0.0000. 29. 0.00 = 0.0000. 30. 0.00 = 0.0000. 31. 0.00 = 0.0000. 32. 0.00 = 0.0000. 33. 0.00 = 0.0000. 34. 0.00 = 0.0000. 35. 0.00 = 0.0000. 36. 0.00 = 0.0000. 37. 0.00 = 0.0000. 38. 0.00 = 0.0000. 39. 0.00 = 0.0000. 40. 0.00 = 0.0000. 41. 0.00 = 0.0000. 42. 0.00 = 0.0000. 43. 0.00 = 0.0000. 44. 0.00 = 0.0000. 45. 0.00 = 0.0000. 46. 0.00 = 0.0000. 47. 0.00 = 0.0000. 48. 0.00 = 0.0000. 49. 0.00 = 0.0000. 50. 0.00 = 0.0000. 51. 0.00 = 0.0000. 52. 0.00 = 0.0000. 53. 0.00 = 0.0000. 54. 0.00 = 0.0000. 55. 0.00 = 0.0000. 56. 0.00 = 0.0000. 57. 0.00 = 0.0000. 58. 0.00 = 0.0000. 59. 0.00 = 0.0000. 60. 0.00 = 0.0000. 61. 0.00 = 0.0000. 62. 0.00 = 0.0000. 63. 0.00 = 0.0000. 64. 0.00 = 0.0000. 65. 0.00 = 0.0000. 66. 0.00 = 0.0000. 67. 0.00 = 0.0000. 68. 0.00 = 0.0000. 69. 0.00 = 0.0000. 70. 0.00 = 0.0000. 71. 0.00 = 0.0000. 72. 0.00 = 0.0000. 73. 0.00 = 0.0000. 74. 0.00 = 0.0000. 75. 0.00 = 0.0000. 76. 0.00 = 0.0000. 77. 0.00 = 0.0000. 78. 0.00 = 0.0000. 79. 0.00 = 0.0000. 80. 0.00 = 0.0000. 81. 0.00 = 0.0000. 82. 0.00 = 0.0000. 83. 0.00 = 0.0000. 84. 0.00 = 0.0000. 85. 0.00 = 0.0000. 86. 0.00 = 0.0000. 87. 0.00 = 0.0000. 88. 0.00 = 0.0000. 89. 0.00 = 0.0000. 90. 0.00 = 0.0000. 91. 0.00 = 0.0000. 92. 0.00 = 0.0000. 93. 0.00 = 0.0000. 94. 0.00 = 0.0000. 95. 0.00 = 0.0000. 96. 0.00 = 0.0000. 97. 0.00 = 0.0000. 98. 0.00 = 0.0000. 99. 0.00 = 0.0000. 100. 0.00 = 0.0000.

Table 2.1.3-3.

WATER-RELATED CARBON FOOTPRINTING REPORT OF THE COMPANY OF 2000-2001			
UNITED STATES			
SCENARIO	2000-2001	2000-2001	2000-2001
SCENARIO 1: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 2: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 3: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 4: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 5: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 6: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 7: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 8: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 9: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3
SCENARIO 10: 100%			
GENERAL OPERATIONS (CO ₂ E)	81.7	81.7	418.7
WATER-RELATED (CO ₂ E)	85.0	85.0	2161.8
WATER-RELATED (CO ₂ E)	81.7	81.7	6482.7
TOTAL	216.7	216.7	12576.3

Table 2.1.3-4. (Page 1 of 2)

Year	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	
1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	
1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	
1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	
1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	
1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	
1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	
1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2															

Table 2.1.3-4. (Page 2 of 2)

[illegible]

Table 2.1.3-5. (Page 1 of 2)

TABLE 1. 1940-1941. 1942-1943. 1944-1945. 1946-1947. 1948-1949. 1950-1951. 1952-1953. 1954-1955. 1956-1957. 1958-1959. 1960-1961. 1962-1963. 1964-1965. 1966-1967. 1968-1969. 1970-1971. 1972-1973. 1974-1975. 1976-1977. 1978-1979. 1980-1981. 1982-1983. 1984-1985. 1986-1987. 1988-1989. 1990-1991. 1992-1993. 1994-1995. 1996-1997. 1998-1999. 2000-2001. 2002-2003. 2004-2005. 2006-2007. 2008-2009. 2010-2011. 2012-2013. 2014-2015. 2016-2017. 2018-2019. 2020-2021. 2022-2023. 2024-2025. 2026-2027. 2028-2029. 2030-2031. 2032-2033. 2034-2035. 2036-2037. 2038-2039. 2040-2041. 2042-2043. 2044-2045. 2046-2047. 2048-2049. 2050-2051. 2052-2053. 2054-2055. 2056-2057. 2058-2059. 2060-2061. 2062-2063. 2064-2065. 2066-2067. 2068-2069. 2070-2071. 2072-2073. 2074-2075. 2076-2077. 2078-2079. 2080-2081. 2082-2083. 2084-2085. 2086-2087. 2088-2089. 2090-2091. 2092-2093. 2094-2095. 2096-2097. 2098-2099. 2100-2101. 2102-2103. 2104-2105. 2106-2107. 2108-2109. 2110-2111. 2112-2113. 2114-2115. 2116-2117. 2118-2119. 2120-2121. 2122-2123. 2124-2125. 2126-2127. 2128-2129. 2130-2131. 2132-2133. 2134-2135. 2136-2137. 2138-2139. 2140-2141. 2142-2143. 2144-2145. 2146-2147. 2148-2149. 2150-2151. 2152-2153. 2154-2155. 2156-2157. 2158-2159. 2160-2161. 2162-2163. 2164-2165. 2166-2167. 2168-2169. 2170-2171. 2172-2173. 2174-2175. 2176-2177. 2178-2179. 2180-2181. 2182-2183. 2184-2185. 2186-2187. 2188-2189. 2190-2191. 2192-2193. 2194-2195. 2196-2197. 2198-2199. 2199-2200. 2200-2201. 2201-2202. 2202-2203. 2203-2204. 2204-2205. 2205-2206. 2206-2207. 2207-2208. 2208-2209. 2209-2210. 2210-2211. 2211-2212. 2212-2213. 2213-2214. 2214-2215. 2215-2216. 2216-2217. 2217-2218. 2218-2219. 2219-2220. 2220-2221. 2221-2222. 2222-2223. 2223-2224. 2224-2225. 2225-2226. 2226-2227. 2227-2228. 2228-2229. 2229-2230. 2230-2231. 2231-2232. 2232-2233. 2233-2234. 2234-2235. 2235-2236. 2236-2237. 2237-2238. 2238-2239. 2239-2240. 2240-2241. 2241-2242. 2242-2243. 2243-2244. 2244-2245. 2245-2246. 2246-2247. 2247-2248. 2248-2249. 2249-2250. 2250-2251. 2251-2252. 2252-2253. 2253-2254. 2254-2255. 2255-2256. 2256-2257. 2257-2258. 2258-2259. 2259-2260. 2260-2261. 2261-2262. 2262-2263. 2263-2264. 2264-2265. 2265-2266. 2266-2267. 2267-2268. 2268-2269. 2269-2270. 2270-2271. 2271-2272. 2272-2273. 2273-2274. 2274-2275. 2275-2276. 2276-2277. 2277-2278. 2278-2279. 2279-2280. 2280-2281. 2281-2282. 2282-2283. 2283-2284. 2284-2285. 2285-2286. 2286-2287. 2287-2288. 2288-2289. 2289-2290. 2290-2291. 2291-2292. 2292-2293. 2293-2294. 2294-2295. 2295-2296. 2296-2297. 2297-2298. 2298-2299. 2299-2300. 2300-2301. 2301-2302. 2302-2303. 2303-2304. 2304-2305. 2305-2306. 2306-2307. 2307-2308. 2308-2309. 2309-2310. 2310-2311. 2311-2312. 2312-2313. 2313-2314. 2314-2315. 2315-2316. 2316-2317. 2317-2318. 2318-2319. 2319-2320. 2320-2321. 2321-2322. 2322-2323. 2323-2324. 2324-2325. 2325-2326. 2326-2327. 2327-2328. 2328-2329. 2329-2330. 2330-2331. 2331-2332. 2332-2333. 2333-2334. 2334-2335. 2335-2336. 2336-2337. 2337-2338. 2338-2339. 2339-2340. 2340-2341. 2341-2342. 2342-2343. 2343-2344. 2344-2345. 2345-2346. 2346-2347. 2347-2348. 2348-2349. 2349-2350. 2350-2351. 2351-2352. 2352-2353. 2353-2354. 2354-2355. 2355-2356. 2356-2357. 2357-2358. 2358-2359. 2359-2360. 2360-2361. 2361-2362. 2362-2363. 2363-2364. 2364-2365. 2365-2366. 2366-2367. 2367-2368. 2368-2369. 2369-2370. 2370-2371. 2371-2372. 2372-2373. 2373-2374. 2374-2375. 2375-2376. 2376-2377. 2377-2378. 2378-2379. 2379-2380. 2380-2381. 2381-2382. 2382-2383. 2383-2384. 2384-2385. 2385-2386. 2386-2387. 2387-2388. 2388-2389. 2389-2390. 2390-2391. 2391-2392. 2392-2393. 2393-2394. 2394-2395. 2395-2396. 2396-2397. 2397-2398. 2398-2399. 2399-2400. 2400-2401. 2401-2402. 2402-2403. 2403-2404. 2404-2405. 2405-2406. 2406-2407. 2407-2408. 2408-2409. 2409-2410. 2410-2411. 2411-2412. 2412-2413. 2413-2414. 2414-2415. 2415-2416. 2416-2417. 2417-2418. 2418-2419. 2419-2420. 2420-2421. 2421-2422. 2422-2423. 2423-2424. 2424-2425. 2425-2426. 2426-2427. 2427-2428. 2428-2429. 2429-2430. 2430-2431. 2431-2432. 2432-2433. 2433-2434. 2434-2435. 2435-2436. 2436-2437. 2437-2438. 2438-2439. 243												
--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2.1.3-5. (Page 2 of 2)

1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Table 2.1.3-6.

[illegible]

THE STATE OF ARIZONA, DEPT. OF AGRICULTURE,
TUCSON, ARIZONA, MAY 15, 1906.
SIR: I HAVE THE HONOR TO ACKNOWLEDGE YOUR LETTER OF MAY 10, 1906,
AND IN RESPONSE TO ADVISE YOU THAT THE SAME HAS BEEN
FORWARDED TO THE APPROPRIATE AGENCIES FOR THEIR CONSIDERATION.

Table 2.1.4-1.

PROJECTED BASELINE POPULATION, SEX RELATED FORMATION CHANGE, AND COMPARATIVE FORMATION CHANGE RELATED TO HX AND OTHER PROJECTS, BY ALTERNATIVE, IN MILLION

ALTERNATIVE	1985	1991	1998	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
BASELINE POPULATION													
WITH THIRD GROUND (G3)	9670	10013	10450	10740	11177	11432	11607	11731	11779	11705	11740	11746	11750
WITH OTHER PROJECTS (G2)	11879	12671	13042	13246	13402	13575	13740	13870	13970	14067	14150	14224	14298
% HC ABOVE TC	23.0	26.5	31.5	31.4	33.2	35.1	37.1	38.3	39.5	40.6	41.7	42.8	43.9
FOURTH D ACTION													
SEX IMITIG WITH TC	0	0	1104	4131	1470	3922	6347	2946	72	71	71	71	70
% ABOVE TC BASELINE	0.0	0.0	10.6	37.9	31.0	34.3	54.3	24.7	0.6	0.6	0.6	0.6	0.6
SEX IMITIG WITH TC	0	0	1077	4091	1473	3873	6200	2709	61	61	60	59	57
% ABOVE TC PROJECTS	22.91	26.58	34.61	38.97	40.70	43.16	45.53	47.18	28.02	28.03	27.75	27.75	27.75
% ABOVE TC BASELINE	23.0	26.5	31.5	31.4	33.2	35.1	37.1	38.3	39.5	40.6	41.7	42.8	43.9
ALTERNATIVE 2													
SEX IMITIG WITH TC	0	0	1723	6452	1394	2087	2407	2186	1624	1375	1180	1367	1367
% ABOVE TC BASELINE	0.0	0.0	17.1	60.7	13.0	19.2	20.6	18.4	13.1	11.6	10.9	10.9	10.9
SEX IMITIG WITH TC	0	0	1714	6396	1300	1929	2370	2190	1621	1367	1180	1367	1367
% ABOVE TC PROJECTS	22.91	26.58	34.61	38.97	40.70	43.16	45.53	47.18	28.02	28.03	27.75	27.75	27.75
% ABOVE TC BASELINE	23.0	26.5	31.5	31.4	33.2	35.1	37.1	38.3	39.5	40.6	41.7	42.8	43.9
ALTERNATIVE 5													
SEX IMITIG WITH TC	0	0	1103	4141	1504	3971	6307	2980	114	111	111	111	112
% ABOVE TC BASELINE	0.0	0.0	10.6	37.9	31.0	34.3	54.3	24.7	0.9	0.9	0.9	0.9	0.9
SEX IMITIG WITH TC	0	0	1077	4091	1473	3873	6200	2709	61	61	60	59	57
% ABOVE TC PROJECTS	22.91	26.58	34.61	38.97	40.70	43.16	45.53	47.18	28.02	28.03	27.75	27.75	27.75
% ABOVE TC BASELINE	23.0	26.5	31.5	31.4	33.2	35.1	37.1	38.3	39.5	40.6	41.7	42.8	43.9
ALTERNATIVE 6													
SEX IMITIG WITH TC	0	0	1104	4141	1504	3971	6307	2980	114	111	111	111	112
% ABOVE TC BASELINE	0.0	0.0	10.6	37.9	31.0	34.3	54.3	24.7	0.9	0.9	0.9	0.9	0.9
SEX IMITIG WITH TC	0	0	1077	4091	1473	3873	6200	2709	61	61	60	59	57
% ABOVE TC PROJECTS	22.91	26.58	34.61	38.97	40.70	43.16	45.53	47.18	28.02	28.03	27.75	27.75	27.75
% ABOVE TC BASELINE	23.0	26.5	31.5	31.4	33.2	35.1	37.1	38.3	39.5	40.6	41.7	42.8	43.9

in-migrants, while the equivalent proportions for military operations and civilian indirect and operations populations would be 36 percent, and 27 percent, respectively, as shown in Table 2.1.4-2. The construction-related population, a large share of whom would be workers present without families, would likely have higher incomes, a slightly larger family household size, and younger age distribution than the general population (Mountain West Research, Inc., 1975), while the military-related population would contain a large share of single persons and have a younger age structure and lower average income (at least for enlisted personnel) than the general population. The civilian operations and indirect population generated by project-related expansion of local economic activity would likely approximate the characteristics of the population of the western United States. The construction-related and indirect populations are projected to be temporarily present in Millard County, with the permanent in-migrants comprised entirely of military and civilian operations personnel and their dependents. About 38 percent of the in-migrants present in the peak year (9,200 persons) are projected to be civilian labor force participants and another 25 percent (6,000) would be school age population. In the long term about 16 percent of the 13,700 permanent in-migrants would be civilian labor force participants and another 28 percent are projected to be school age population.

The projected M-X-related in-migrant population at the county level has been disaggregated to three spatial categories of residence: construction camps, the operating base, and local communities. In 1988, the peak year, about 60 percent of the in-migrants present (14,300 persons) would require accommodations in local communities, while 32 percent (7,600) would be housed onbase and nine percent (2,100) in temporary construction camp facilities, as shown in Table 2.1.4-3. In the long term only about one-third of the project-related population is projected to reside in Millard County's communities, with two-thirds accommodated on the operations base. The community population generated within Millard County by the proposed base in Alternative 2 is most likely to be absorbed in the Delta/Hinckley area, with smaller effects in the Fillmore and Holden communities.

Smaller population effects from a second base near Delta would also be experienced in adjacent Juab and Beaver Counties, most likely in the vicinity of the Milford and Nephi communities. The project-related population projected to be present in these two counties in the long run is about 700 and 100, respectively, in Juab and Beaver.

EFFECTS ON LAND USE (2.1.5)

Community Land Use

Millard County, Utah, will be subject to major community land area demands under only one of the eight combinations of the operation bases. This is Alternative 2 with an CB II at Delta. Under five of the remaining options, Millard County will receive temporary demands for community land areas from the nearby construction activities on the DDA. The Proposed Action and Alternative 5 would place long term, although minor, land area requirements on Millard County. Table 2.1.5-1 details the community land area requirements for Millard County under the Proposed Action and relevant alternatives.

Table 2.1.4-2.

PROJECTED CUMULATIVE INFORMATION IN MIGRATION BY PROJECT RELATED EMPLOYMENT CATEGORY & BY ALTERNATIVE 10 MILLION
ASSUMING TREND DATA

ALTERNATIVE CATEGORY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
OVERALL ALTERNATIVE 1													
BASE CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0
CLUSTER CONSTRUCTION	0	0	1004	3761	1100	3560	5571	2074	0	0	0	0	0
ASSEMBLY & CHECKOUT	0	0	0	0	0	0	0	0	0	0	0	0	0
MILITARY OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0
CIVILIAN OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0
INDIRECT	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1104	4141	1100	3560	5571	2074	0	0	0	0	0
ALTERNATIVE 2													
BASE CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0
CLUSTER CONSTRUCTION	0	0	1004	3761	1100	3560	5571	2074	0	0	0	0	0
ASSEMBLY & CHECKOUT	0	0	0	0	0	0	0	0	0	0	0	0	0
MILITARY OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0
CIVILIAN OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0
INDIRECT	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1104	4141	1100	3560	5571	2074	0	0	0	0	0
ALTERNATIVE 3													
BASE CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0
CLUSTER CONSTRUCTION	0	0	1004	3761	1100	3560	5571	2074	0	0	0	0	0
ASSEMBLY & CHECKOUT	0	0	0	0	0	0	0	0	0	0	0	0	0
MILITARY OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0
CIVILIAN OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0
INDIRECT	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1104	4141	1100	3560	5571	2074	0	0	0	0	0
ALTERNATIVE 4													
BASE CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0
CLUSTER CONSTRUCTION	0	0	1004	3761	1100	3560	5571	2074	0	0	0	0	0
ASSEMBLY & CHECKOUT	0	0	0	0	0	0	0	0	0	0	0	0	0
MILITARY OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0
CIVILIAN OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0
INDIRECT	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1104	4141	1100	3560	5571	2074	0	0	0	0	0

EMPLOYMENT CATEGORY IS FOR PRIMARY WORKER IN HOUSEHOLD SOURCE: HOUSEHOLDS, 1 NOV 80

Table 2.1.4-3.

PROJECTED CUMULATIVE POPULATION IN MIGRATION BY PLACE OF RESIDENCE, BY ALTERNATIVE, IN MILLION
ASSUMING TREND BASE LINE

ALTERNATIVE / PLACE OF RESIDENCE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
PROPOSED ACTION													
CONSTRUCTION CAMPS	0	0	204	1259	953	1000	2068	1313	0	0	0	0	0
OPERATIONS BASE	0	0	0	0	0	0	0	0	0	0	0	0	0
LOCAL COMMUNITIES	0	0	0.0	2072	2517	2918	4279	1634	72	21	21	21	20
TOTAL	0	0	1104	4131	3470	3922	6147	2946	72	21	21	21	20
ALTERNATIVE 2													
CONSTRUCTION CAMPS	0	0	204	1260	959	1095	2072	1318	0	0	0	0	0
OPERATIONS BASE	0	0	0	97	2962	5605	7600	9638	9248	9268	9268	9268	9268
LOCAL COMMUNITIES	0	0	1308	5003	9202	13327	14345	11030	6979	4847	4431	4411	4411
TOTAL	0	0	1793	6442	13704	20027	24017	21986	16247	13715	13680	13672	13679
ALTERNATIVE 5													
CONSTRUCTION CAMPS	0	0	204	1259	953	1000	2068	1313	0	0	0	0	0
OPERATIONS BASE	0	0	0	0	0	0	0	0	0	0	0	0	0
LOCAL COMMUNITIES	0	0	0.0	2002	2550	2803	4421	1676	114	113	113	113	112
TOTAL	0	0	1104	4141	3504	3921	6402	2988	114	113	113	113	112
ALTERNATIVE 6													
CONSTRUCTION CAMPS	0	0	204	1259	953	1000	2068	1313	0	0	0	0	0
OPERATIONS BASE	0	0	0	0	0	0	0	0	0	0	0	0	0
LOCAL COMMUNITIES	0	0	0.0	2002	2550	2803	4421	1676	114	113	113	113	112
TOTAL	0	0	1104	4141	3504	3921	6402	2988	114	113	113	113	112

SOURCE: DEER C. REPORTS, 1989, 1990

Table 2.1.5-1.

COMPARATIVE PER-RELATED LAND REQUIREMENTS (ACRES) BY USE CATEGORY, BY ALTERNATIVE IN MILLARD
ASSUMING TREND BASELINE

ALTERNATIVE / LAND USE CATEGORY	1983	1991	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
PROPOSED ACTION:													
PERMANENT HOMES	0	0	0	0	0	0	2	1	5	6	6	6	6
MOBILE HOMES	0	0	49	129	151	170	256	96	2	3	3	3	3
SUBTOTAL	0	0	49	129	151	170	258	96	7	9	9	9	9
RETAIL CORP./INDUS.	0	0	5	19	10	20	27	13	0	0	0	0	0
STG. AND TRNS.	0	0	31	119	105	149	170	69	3	3	3	3	3
PUBLIC/INSTITUTIONAL	0	0	16	58	51	57	66	33	1	1	1	1	1
TOTAL	0	0	101	306	327	396	549	215	10	13	13	13	13
ALTERNATIVE 2:													
PERMANENT HOMES	0	0	12	39	141	276	298	379	407	317	314	314	314
MOBILE HOMES	0	0	90	279	507	691	723	465	194	61	61	61	61
SUBTOTAL	0	0	102	318	648	967	1021	844	591	378	375	375	375
RETAIL CORP./INDUS.	0	0	0	30	51	76	86	69	35	31	32	32	32
STG. AND TRNS.	0	0	60	240	413	620	670	537	357	297	290	290	290
PUBLIC/INSTITUTIONAL	0	0	27	91	161	229	250	183	110	71	71	71	71
TOTAL	0	0	205	609	1,274	1,809	2,027	1,633	1,100	775	777	777	777
ALTERNATIVE 3:													
PERMANENT HOMES	0	0	0	0	1	2	1	6	7	9	9	9	9
MOBILE HOMES	0	0	69	173	153	172	201	99	10	11	11	11	11
SUBTOTAL	0	0	69	173	154	174	202	105	17	20	20	20	20
RETAIL CORP./INDUS.	0	0	5	17	10	26	32	26	0	0	0	0	0
STG. AND TRNS.	0	0	11	150	105	150	179	117	1	1	1	1	1
PUBLIC/INSTITUTIONAL	0	0	16	59	54	50	54	25	19	19	20	20	20
TOTAL	0	0	101	391	324	352	373	273	46	40	41	41	41
ALTERNATIVE 4:													
PERMANENT HOMES	0	0	0	0	0	0	0	0	0	0	0	0	0
MOBILE HOMES	0	0	49	129	154	174	204	130	9	8	8	8	8
SUBTOTAL	0	0	49	129	154	174	204	130	9	8	8	8	8
RETAIL CORP./INDUS.	0	0	5	19	10	20	27	13	0	0	0	0	0
STG. AND TRNS.	0	0	31	120	109	179	179	67	6	6	6	6	6
PUBLIC/INSTITUTIONAL	0	0	16	59	51	50	66	34	1	1	1	1	1
TOTAL	0	0	101	391	324	372	381	274	16	15	15	15	15

COMPARATIVE PER-RELATED LAND REQUIREMENTS (ACRES) BY USE CATEGORY, BY ALTERNATIVE IN MILLARD

Alternative 2

As noted above, Alternative 2 has the largest land area requirements for Millard County. Construction activity would begin in 1984 when 205 acres of community land would be needed. This requirement climbs to a peak in 1988 of 2,027 acres. In 1991, the operational period begins with a decrease in land requirements to approximately 725 acres. As in other areas, land for housing is the land use category with the largest requirements. Street and highways also will need large portions of the newly developed areas with one-third of the land requirements projected for this purpose in the peak year.

Impact on Availability of Land

On a countywide basis, the peak period demands would be approximately one-third of the vacant land within the municipalities of Millard County. This would leave approximately 3,700 acres of vacant urban land still available for baseline growth. Table 2.1.5-2 provides the above information plus data on the percentage growth in the developed urban acreage.

In analyzing the requirements on a community by community basis, it is assumed that the communities closest to the OB would be heavily impacted. Hinckley, the largest of the communities in the immediate area, has almost 1,800 vacant acres, while Delta and Oak City have a combined total of 454 vacant acres. Delta and Oak City may need some expansion while Hinckley should not. Fillmore, approximately 50 mi from the OB site, is the largest community in Millard County. Vacant land in Fillmore exceeds 1,200 acres--a quantity that should permit baseline growth to continue without adverse impact from the OB construction activity.

Spillover effects are anticipated to extend into Beaver County. The spillover is expected to peak at 310 acres, the majority of which would be at Milford. Vacant land in Milford totalled 190 acres in 1978. As a result, the impact on vacant land availability would be adverse unless Milford expanded its urban boundaries. Constraints to such an action have not been assessed at this time.

Similarly, Nephi to the north in Juab County is expected to be subject to increases in urban development. These should amount to about 520 acres in the peak year. Nephi has approximately 260 vacant acres and hence would be adversely impacted without the annexation of additional land.

Long term demands are 36 percent of the peak period demands in Millard County. On a countywide basis, these requirements would not impose significant impacts upon the availability of urban land. Examining the communities closest to the OB site, Hinckley would be able to handle the entire long term requirement, thus minimizing the need for annexations in Delta, Oak City, or Fillmore. Long term demands in Juab County approximate 100 acres which can be handled by vacant land currently available, while Beaver County requirements are negligible.

Other Impacts

The peak period of growth will increase the size of the communities in Millard County by about 60 percent. Since this change will take place over only five years, the ability of the communities to guide the growth in a desirable and efficient

Table 2.1.5-2. M-X urban land requirements and impacts -
Millard County.

ALTERNATIVE TYPE OF CAPACITY	CURRENT URBAN LAND**			TERM YEAR				LONG TERM			
				LAND REQUIREMENT		PROTECTED VACANT LAND		LAND REQUIREMENT		EXISTING VACANT LAND	
	VACANT ACRES	DEVELOPED ACRES	TOTAL ACRES	ACRES	% OF DEVELOPED LAND	ACRES	% OF TOTAL URBAN LAND	ACRES	% OF DEVELOPED LAND	ACRES	% OF TOTAL URBAN LAND
2. 1977	2,761	3,415	6,176	2,027	55.4	1,734	49	127	24.3	1,734	74.4
3. 1980 4. 1985	2,761	3,415	6,176	553	18.2	5,208	76.4	29	0.7	1,734	42.6

*Only representative alternatives are listed.

**Includes land within existing incorporated and unincorporated communities.

Source: Six County Commissioners, 1979.

manner will be minimal. As a result, it can be expected that numerous conflicting land uses, "leapfrog" developments, and other symptoms of poor planning will emerge. The conclusion of the construction period may bring in problems of returning land used for temporary structures to former land uses as well as the removal of abandoned structures.

The periods of growth and departure will cause great fluctuations in property values. In addition, the character of the communities will undergo significant changes due to the construction of numerous temporary structures and abbreviated periods for design review of development proposals.

Other Alternatives

Peak year requirements under the Proposed Action and Alternatives 1, 3, 4, 5, and 6 are approximately one-quarter of the requirements under Alternative 2. These requirements are the result of construction activity on DDA and spillovers from the construction of an OB in Beaver County. In the long term, Millard County will be subject to spillovers from the operation phases of the Proposed Action and Alternative 5. These spillover requirements are minor and will not significantly impact Millard County.

Conclusions

On a countywide basis, significant impacts on the availability of land will not be felt in the short or long term periods. Examination of the individual communities shows that annexation may be necessary in Delta and Oak City as well as in Milford (Beaver County) and Nephi (Juab County) in order to avoid adverse impacts during the peak period. The rapidity of growth in Millard County will severely hinder the implementation of proper planning practices and development of efficient land use patterns.

Rural Land Use

This section will discuss two types of land uses that could be affected by a potential operating base at Delta, Utah. They are agricultural and recreation.

Agriculture

Although no croplands exist at the potential operating base near Delta, nor within the suitability zone, irrigated croplands do exist near the city of Delta about 15 mi northeast of the proposed site. Because of its proximity to the potential operating base, the croplands within the suitability zone could be subject to pressure for private urban development unless laws protecting such farmland are adopted and enforced by the county.

Effects on Recreation

No fishing, hunting or other concentrated recreational sites occur within the suitability envelope of the proposed Delta OB (Figure 2.1.5-1). Dispersed recreation such as rock hounding, small game hunting and ORV use will be restricted within the envelope area. At present, dispersed recreation is rather limited in this area.

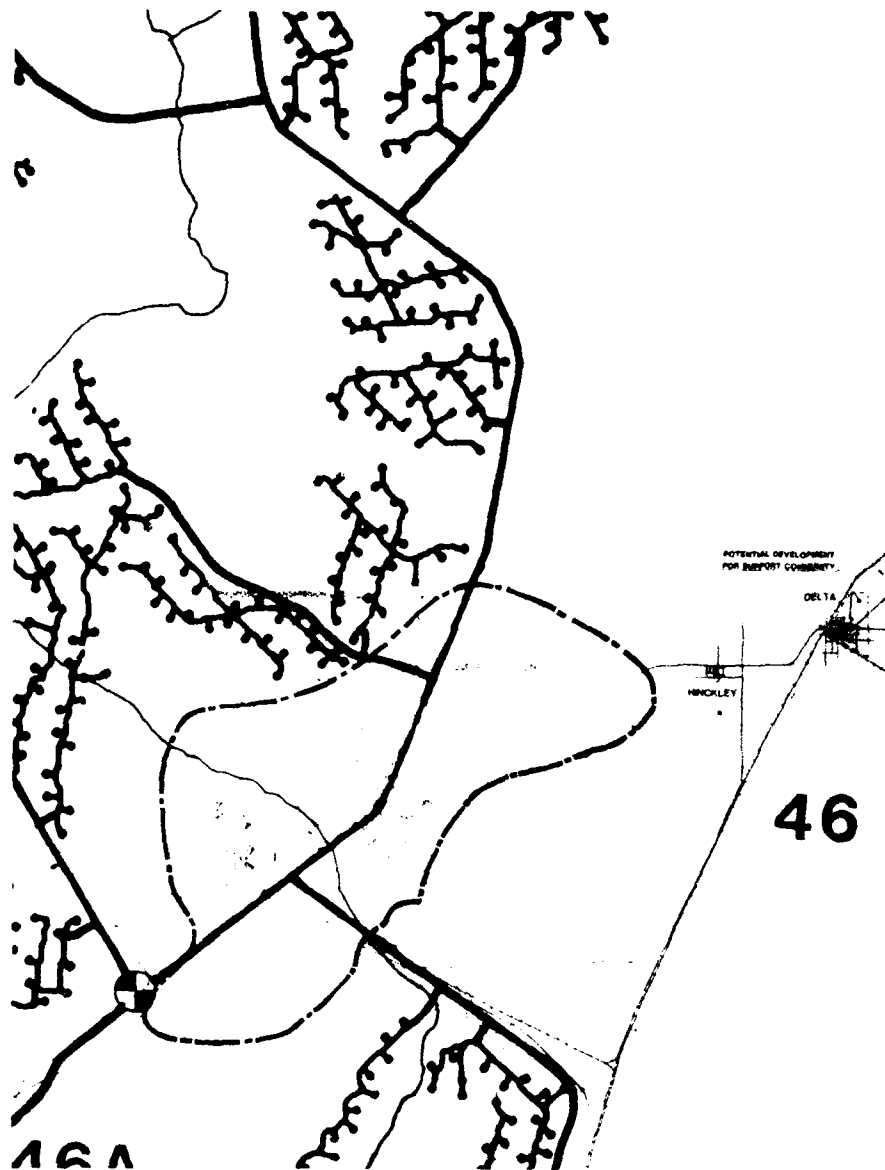


Figure 2.1.5-1. Assumed area of influence around the Delta OB site.

Recreational demand is expected to increase concomitantly with the population in-migration. In Alternative 2 where Delta is a second base, M-X will effect a 206 percent increase in population over baseline projections in peak year 1988 for Millard County. This is expected to drop off to a steady state of 110 percent increase over baseline by 1992. These substantial population increases will have an equivalent effect upon recreational demand and needs in the area. According to the indirect effect index analyses, the following recreational sites are expected to receive a substantial proportion of the M-X induced demand: Oak Creek Campground, Yuba Lake State Park and Little Sahara Recreational Area.

Fishing resource sites within approximately 50 mi of the proposed Delta OB would be expected to receive the largest amount of new fishing pressure. Resources within 50 mi are in Snake, Wah Wah, Milford, White, Dugway, and Government Creek hydrologic subunits and in the Sevier River drainage east of Delta. For a list of the fishing resources within these areas see the aquatic habitats and biota technical report.

Utah SCORP (1978 draft) indicates a projected shortage of camping units and picnic tables and that improvements of the Yuba Lake Marina are needed in this region. These needs will be increased with the projected increase in M-X demand.

EFFECTS ON LAND OWNERSHIP (2.1.6)

Figure 2.1.6-1 shows the potential operating base at Delta, Utah, and the land ownerships in the area. Table 2.1.6-1 shows the number of acres of land of each ownership type that would be occupied by the potential operating base and facilities, and the number of acres of each ownership type within the suitability zone around the potential base.

It can be seen that 72 percent of the area of the operating base facilities would be located on BLM land, and 28 percent on private land. Eighty percent of the suitability zone is BLM land, with the remainder divided between state and private land.

The 4,650 acres of BLM land required for the operating base is equal to 0.5 percent of the BLM land in Iron County. The 1,790 acres of state land for the base is equal to 0.1 percent of the state land in Iron County. These are not considered to be significant impacts.

EFFECTS ON HOUSING (2.1.7)

Millard County is projected to experience the largest impacts under Alternative 2, when Operating Base II is slated to be near Delta. Here, the M-X-related housing requirements reach a total of 4,818 in 1988, comprised of 761 single-family, 441 multi-family, and 3,617 mobile homes (Table 2.1.7-1). After the peak-year, the housing needs decline to a long term total of 1,522 units (913 single-family, 304 multi-family, and 304 mobile homes). Such a large difference between peak-year and long term needs will result in large surpluses of housing units, most of which will be mobile homes and that will probably have to be removed since local baseline annual requirements are not likely to be large enough to absorb the units. The presence of other projects, does little to reduce the net M-X requirements (Table 2.1.7-2), or to reduce the surpluses, but does contribute to a substantially larger

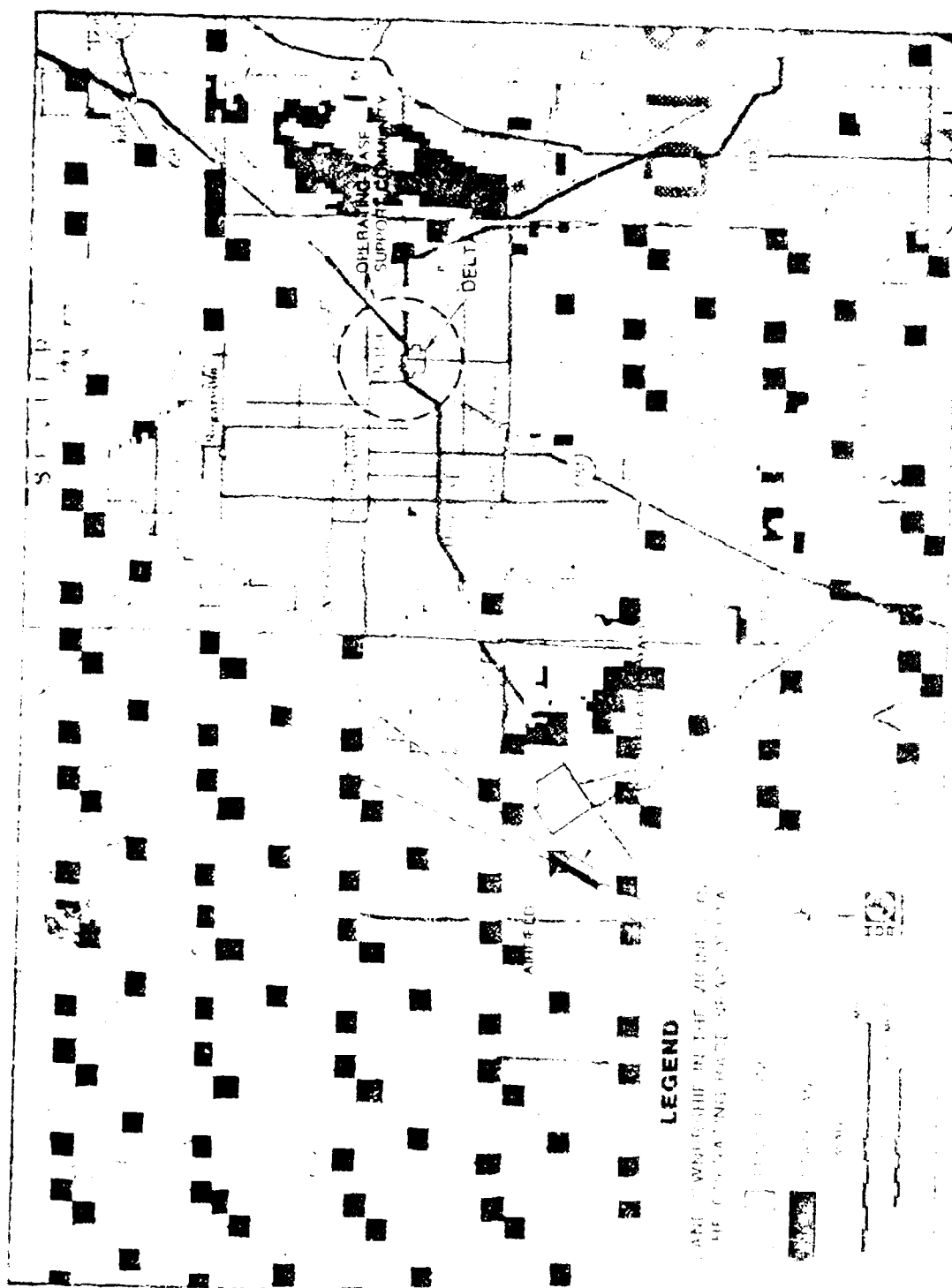


Table 2.1.6-1. Land ownership at potential operating base facilities at Delta, Utah.

OWNERSHIP TYPE	OPERATING BASE FACILITIES		SUITABILITY ZONE	
	ACRE	PERCENT OF OB	ACRE	PERCENT OF ZONE
Private	0	0	11,520	10
State	1,790	28	12,160	10
BLM	4,650	72	85,360	80
Total	6,440	100	119,040	100

3856

Source: Department of the Interior, 1977.

AD-A095 780

HENNINGSON DURHAM AND RICHARDSON SANTA BARBARA CA

F/G 16/1

M-X ENVIRONMENTAL TECHNICAL REPORT, ALTERNATIVE

POTENTIAL OPERA--ETC(U)

DEC 80

F04704-78-C-0029

UNCLASSIFIED

M-X-ETR-7

AFSC-TR-81-22

NL

2 of 1
80-100

END
DATE
FILMED
4-81
DTIC

Table 2.1.7-1.

CUMULATIVE M-X RELATED HOUSING UNIT REQUIREMENTS IN LOCAL COMMUNITIES BY HOUSING TYPE, BY ALTERNATIVE, IN HILLARD
ADDITIONAL BASELINE

ALTERNATIVE / HOUSING TYPE	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	3843	3386	3530	3693	3778	3837	3944
PROPOSED ACTION							
SINGLE FAMILY UNITS	0	0	0	0	0	0	0
MULTI-FAMILY UNITS	0	0	0	0	0	0	0
MOBILE HOMES	0	0	246	862	755	850	1279
TOTAL M-X RELATED	0	0	246	862	755	850	1279
M-X PLUS BASELINE	3243	3386	3776	4555	4533	4710	5231
ALTERNATIVE 2							
SINGLE FAMILY UNITS	0	0	26	93	352	704	761
MULTI-FAMILY UNITS	0	0	26	85	263	407	441
MOBILE HOMES	0	0	452	1493	2508	3404	3617
TOTAL M-X RELATED	0	0	504	1671	3124	4515	4818
M-X PLUS BASELINE	3243	3386	4034	5364	6502	8374	8762
ALTERNATIVE 3							
SINGLE FAMILY UNITS	0	0	0	1	3	6	10
MULTI-FAMILY UNITS	0	0	0	0	1	2	5
MOBILE HOMES	0	0	246	864	764	861	1208
TOTAL M-X RELATED	0	0	246	865	768	869	1303
M-X PLUS BASELINE	3243	3386	3776	4538	4546	4728	5277
ALTERNATIVE 6							
SINGLE FAMILY UNITS	0	0	0	0	0	0	0
MULTI-FAMILY UNITS	0	0	0	0	0	0	0
MOBILE HOMES	0	0	246	865	768	869	1303
TOTAL M-X RELATED	0	0	246	865	768	869	1303
M-X PLUS BASELINE	3243	3386	3776	4538	4546	4728	5277

Table 2.1.7-2.

CUMULATIVE M-X RELATED HOUSING UNIT REQUIREMENTS IN LOCAL COMMUNITIES BY WORKING TYPE, BY ALTERNATIVE, IN HILLAND
ASSUMING HIGH BASELINE

ALTERNATIVE / HOUSING TYPE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	4017	4277	5348	6729	6242	6372	6174	5449	5037	5086	5143	5192	5234
PROPOSED ACTION													
SINGLE FAMILY UNITS	0	0	0	0	0	0	2	7	10	13	14	13	13
MULTI-FAMILY UNITS	0	0	0	0	0	0	1	2	5	5	5	4	4
MOBILE HOMES	0	0	240	852	746	838	1266	474	8	6	5	4	4
TOTAL M-X RELATED	0	0	240	852	746	838	1270	484	23	23	23	22	22
M-X PLUS BASELINE	4017	4277	5588	7181	6988	7210	7464	5933	5060	5109	5166	5214	5256
ALTERNATIVE 2													
SINGLE FAMILY UNITS	0	0	25	91	348	698	756	982	1066	839	911	911	911
MULTI-FAMILY UNITS	0	0	25	83	260	404	438	498	493	305	304	304	304
MOBILE HOMES	0	0	437	1470	2484	3381	3927	2313	914	382	304	304	304
TOTAL M-X RELATED	0	0	486	1644	3092	4483	4790	3794	2475	1526	1518	1518	1518
M-X PLUS BASELINE	4017	4277	5834	7973	9335	10855	10984	9243	7512	6612	6661	6710	6752
ALTERNATIVE 3													
SINGLE FAMILY UNITS	0	0	0	0	0	3	7	13	17	21	23	23	23
MULTI-FAMILY UNITS	0	0	0	0	0	1	3	6	8	8	8	8	8
MOBILE HOMES	0	0	240	852	748	846	1275	482	14	10	8	8	8
TOTAL M-X RELATED	0	0	240	852	748	850	1283	500	39	39	38	38	38
M-X PLUS BASELINE	4017	4277	5588	7181	6990	7322	7479	5949	5076	5125	5181	5230	5272
ALTERNATIVE 6													
SINGLE FAMILY UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0
MULTI-FAMILY UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0
MOBILE HOMES	0	0	240	852	748	846	1283	500	39	39	38	38	38
TOTAL M-X RELATED	0	0	240	852	748	850	1283	500	39	39	38	38	38
M-X PLUS BASELINE	4017	4277	5588	7181	6990	7322	7479	5949	5076	5125	5181	5230	5272

combined housing unit requirement in the peak-year and over the long term. For example, in 1988, the peak-year, the combined total requirement is now projected at 7,040 housing units, some 179 percent over baseline requirements, compared to 122 percent above for M-X alone. Similarly, in 1994, the combined total comes to 2,522 housing units, about 60 percent over baseline, rather than 36 percent with M-X alone (Table 2.1.7-3).

Millard County will still have housing impacts even though an operating base is not located in the county. For example, small long term permanent impacts are experienced because of spillover from Milford in the case of the Proposed Action, and Alternatives 5 and 6. These total some 26 housing units (16 single-family, 5 multi-family, and 5 mobile homes) under the Proposed Action, and 42 housing units when OB I is near Milford in the case of Alternatives 5 and 6.

Millard County is also projected to be affected by DDA construction activities in all other alternatives, although here the housing requirements are all short-lived and involve only mobile homes that can be fairly readily removed or used elsewhere in the deployment region. In all cases, the presence of other projects will compound the existing M-X requirements (Table 2.1.7-3).

With OB II near Delta under Alternative 2, there will also be spillover effects from Delta, which in the long term are likely to produce housing requirements of some 214 housing units (128 single-family, 43 multi-family, and 43 mobile homes) in Juab County and just 27 mobile homes in Beaver County.

EFFECTS ON COMMUNITY INFRASTRUCTURE (2.1.8)

M-X deployment Alternative 2 identifies a potential second operating base location in the vicinity of Delta (Millard County), Utah. Construction of such a facility would result in the in-migration of construction workers and their families in the short term, as well as long term base personnel. This population in-migration will place additional demands on community infrastructure necessitating the recruitment of more teachers, health care personnel, law enforcement and fire personnel. There will also be impacts on parks and recreation and on basic utilities such as water and solid waste disposal, creating the need for expanded or new facilities. The accommodation of M-X-related needs for community services will be fulfilled primarily by Millard County. Neighboring counties, for the most part, will experience lesser demands of a temporary nature. For that reason the following discussion will concentrate upon the effects likely to be experienced in Millard County under Alternative 2.

Education

Millard County School District, which currently maintains an enrollment capacity of approximately 2,360, is expected to experience enrollment demands in excess of capacity under projected normal growth conditions prior to 1982. This indicates that any additional enrollment demand attributable to M-X would result in stresses to the local educational system above the level which would occur under normal growth conditions.

Table 2.1.8-1 presents the number of school-aged children expected by grade group for each M-X alternative between the years 1982 and 1994 on an annual basis.

Table 2.1.7-3.

CUMULATIVE BASELINE HOUSING UNIT REQUIREMENTS IN LOCAL COMMUNITIES, AND CUMULATIVE TOTAL HOUSING UNIT REQUIREMENTS RELATED TO HX AND OTHER PROJECTS, BY ALTERNATIVE, IN MILLAID

ALTERNATIVE	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS WITH TREND GROWTH (TG) WITH OTHER PROJECTS (OC) Z INC ABOVE TG	3243 4017 23 B	3360 4277 26.5	3530 5148 51.5	3693 6242 65.1	3778 6372 65.1	3944 6194 57.1	4028 5449 33.3	4111 5037 23.5	4147 5006 22.6	4179 5143 23.1	4207 5192 23.4	4229 5234 23.8
PROPOSED ACTION												
M X EXPOSURE WITH TG	0	246	842	755	831	1287	476	27	27	27	27	26
Z ABOVE TG BASELINE	0	0	23.3	70.0	72.0	32.6	12.3	0.7	0.7	0.6	0.6	0.6
M X EXPOSURE WITH TG	0	240	832	746	818	1270	484	23	23	23	22	22
Z ABOVE TG BASELINE	0	0	23.0	70.0	72.0	32.6	12.3	0.7	0.7	0.6	0.6	0.6
M X EXPOSURE WITH TG	773	897	3407	3280	3380	3250	1905	978	965	987	1062	1026
Z ABOVE TG BASELINE	23 B	26.5	58.3	74.4	86.8	87.3	47.3	23.1	23.2	23.6	23.9	24.3
ALTERNATIVE 2												
M X EXPOSURE WITH TG	0	504	1671	3124	4515	4818	3812	2485	1576	1522	1522	1522
Z ABOVE TG BASELINE	0	0	14.3	45.2	82.7	122.2	74.6	60.4	37.0	36.4	36.2	36.0
M X EXPOSURE WITH TG	0	486	1644	3093	4483	4790	3794	2475	1526	1518	1518	1518
M X + OTHER PROJECTS	773	897	3203	4279	5556	7040	5215	3400	2462	2502	2522	2522
Z ABOVE TG BASELINE	23 B	26.5	65.2	147.1	181.3	178.5	127.5	82.7	59.4	59.4	59.5	59.6
ALTERNATIVE 5												
M X EXPOSURE WITH TG	0	246	842	760	849	1303	511	41	42	42	42	42
Z ABOVE TG BASELINE	0	0	23.4	70.0	72.5	33.0	12.7	1.0	1.0	1.0	1.0	1.0
M X EXPOSURE WITH TG	0	240	832	741	818	1270	484	23	23	23	22	22
M X + OTHER PROJECTS	773	897	3407	3280	3380	3250	1905	978	965	987	1062	1026
Z ABOVE TG BASELINE	23 B	26.5	58.3	74.4	86.8	87.3	47.3	23.1	23.2	23.6	23.9	24.3
ALTERNATIVE 6												
M X EXPOSURE WITH TG	0	246	842	760	849	1303	511	41	42	42	42	42
Z ABOVE TG BASELINE	0	0	23.4	70.0	72.5	33.0	12.7	1.0	1.0	1.0	1.0	1.0
M X EXPOSURE WITH TG	0	240	832	741	818	1270	484	23	23	23	22	22
M X + OTHER PROJECTS	773	897	3407	3280	3380	3250	1905	978	965	987	1062	1026
Z ABOVE TG BASELINE	23 B	26.5	58.3	74.4	86.8	87.3	47.3	23.1	23.2	23.6	23.9	24.3

Table 2.1.8.1.

PROJECTED BASELINE AND M-1 INDUCED SCHOOL ENROLLMENTS BY GRADE LEVEL, BY ALTERNATIVE, IN HILLAND
ASSUMING TREND BASELINE

ALTERNATIVE / MURDER PUPILS BY GRADE LEVEL	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
SCHOOL ENROLLMENTS	2498	2403	2719	2811	2909	2972	3037	3102	3166	3194	3218	3240	3257
PROPOSED ACTION													
K-4	0	0	141	493	404	408	735	277	7	7	7	7	7
7-9	0	0	71	248	217	244	367	130	4	4	4	4	4
10-12	0	0	71	248	217	244	367	130	4	4	4	4	4
TOTAL M-1 RELATED	0	0	283	991	828	974	1470	533	14	14	14	14	14
M-1 PLUS BASELINE	2498	2403	3002	3803	3737	3948	4507	3635	3180	3208	3232	3254	3271
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	10.4	34.8	29.8	32.8	48.4	17.8	0.4	0.4	0.4	0.4	0.4
ALTERNATIVE 2													
K-4	0	0	211	737	1420	2491	3013	2811	2219	1963	1941	1941	1941
7-9	0	0	103	368	810	1244	1504	1403	1110	903	981	901	981
10-12	0	0	103	368	810	1244	1504	1403	1110	903	981	901	981
TOTAL M-1 RELATED	0	0	417	1473	3039	4978	4024	3616	3239	2909	2922	2922	2922
M-1 PLUS BASELINE	2498	2403	3140	4318	6148	7933	9043	8724	7404	7124	7140	7142	7179
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	15.5	51.8	111.3	167.4	198.4	181.2	140.2	123.0	121.9	121.0	120.4
ALTERNATIVE 3													
K-4	0	0	141	493	404	408	737	277	7	7	7	7	7
7-9	0	0	71	248	217	244	367	130	4	4	4	4	4
10-12	0	0	71	248	217	244	367	130	4	4	4	4	4
TOTAL M-1 RELATED	0	0	283	991	828	974	1470	533	14	14	14	14	14
M-1 PLUS BASELINE	2498	2403	3002	3803	3737	3948	4507	3635	3180	3208	3232	3254	3271
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	10.4	34.8	29.8	32.8	48.4	17.8	0.4	0.4	0.4	0.4	0.4
ALTERNATIVE 4													
K-4	0	0	141	493	404	408	737	277	7	7	7	7	7
7-9	0	0	71	248	217	244	367	130	4	4	4	4	4
10-12	0	0	71	248	217	244	367	130	4	4	4	4	4
TOTAL M-1 RELATED	0	0	283	991	828	974	1470	533	14	14	14	14	14
M-1 PLUS BASELINE	2498	2403	3002	3803	3737	3948	4507	3635	3180	3208	3232	3254	3271
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	10.4	34.8	29.8	32.8	48.4	17.8	0.4	0.4	0.4	0.4	0.4

SOURCE: IOWA SCIENCES, 1-MAY-80

As indicated, Alternative 2 may add up to 420 additional pupils to the school district, an increase of approximately 16.0 percent over the 2,500 enrollments estimated to occur under baseline growth conditions. By 1989, the year of peak enrollment growth attributable to M-X, the increase over baseline growth under Alternative 2 approximates nearly 200.0 percent: at this time, baseline enrollments are anticipated to number 3,260.

Subsequent to peak year enrollment demands resulting from M-X, enrollment levels can be expected to stabilize, the level of which may be useful for long-range educational planning purposes. Table 2.1.8-1 indicates that the Millard County School District may have to provide long-term educational services for nearly 7,200 students should an M-X operating base be located near Delta. Of this total number of students requiring education, slightly more than half may be M-X induced. Should no operating base be located in Millard County, the school district would still receive additional demands for services as a result of spill-over effects of technical facility construction in adjacent counties. The short and long-term effects of these enrollment demands under Alternative 6 and the Proposed Action would be considerably less than under Alternative 2. No long-term enrollments attributable to M-X are anticipated under any of the remaining alternatives. Regardless of which M-X deployment alternative is selected, it is evident that given the posture of existing facility inadequacy to meet even the projected number of baseline enrollments expected for the area, that M-X related enrollments of both short and long-term duration will certainly accentuate the need for additional facilities and personnel.

Table 2.1.8-2 indicates the number of teachers which may be required to accommodate baseline and M-X related enrollment demand on a grade group basis for all years between 1982 and 1994. As was the case with enrollments, Alternative 2 will require the largest number of teachers. Alternative 2 may initially require 12 additional teachers to accommodate M-X related enrollment increase in 1984, necessitate nearly 255 by 1988, and require approximately 170 to accommodate long-term demands, an increase of more than 110.0 percent over the 150 teachers who will be necessary to accommodate long-term demands under normal growth conditions. It is likely that the school district may experience difficulty in attracting and retaining an adequate staffing level during both peak and long-term conditions.

The proportion of total enrollments and teachers required attributable to other projects in the area when compared to those attributable to M-X plus baseline growth is substantial. For example, under Alternative 2, in which a small operating base may be located near Delta, of the nearly 10,800 enrollments which the school district might expect during peak year, 1988, more than 15.0 percent are other project related. This indicates that the already inadequate capability of the district to provide educational services would be further compounded by M-X and other project requirements.

Health Care

M-X project related requirements for health care personnel and facilities are shown in Table 2.1.8-3 for Millard County. Under Alternative 2 with the second base located near Delta, the need for health care personnel peaks in 1987, when 15 physicians, 44 nurses, 4 dentists, 2 mental health personnel and 37 additional hospital beds would be required. M-X related peak demand increases the normal

Table 2.1.8-2.

PROJECTED BASELINE AND N-1 INDUCED TEACHER REQUIREMENTS BY GRADE LEVEL, BY ALTERNATIVE, IN MILLARD
ADMINISTRATIVE DISTRICT

ALTERNATIVE / NUMBER TEACHERS BY GRADE LEVEL	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	112	118	123	129	132	135	138	141	142	143	146	147	148
PROPOSED ACTION													
N-4	0	0	4	20	17	20	24	11	0	0	0	0	0
7-9	0	0	2	11	9	11	14	4	0	0	0	0	0
10-12	0	0	2	11	10	11	17	4	0	0	0	0	0
TOTAL N-1 RELATED	0	0	8	42	37	42	55	19	0	0	0	0	0
N-1 PLUS BASELINE	112	118	131	171	169	177	193	160	142	143	146	147	148
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	9.7	32.9	28.6	30.3	44.9	16.2	0.7	0.7	0.7	0.7	0.7
ALTERNATIVE 2													
N-4	0	0	8	29	48	100	121	112	89	79	78	78	78
7-9	0	0	5	16	35	84	88	44	48	43	43	43	43
10-12	0	0	5	17	37	87	88	44	50	45	45	45	45
TOTAL N-1 RELATED	0	0	18	62	120	274	297	140	188	167	166	166	166
N-1 PLUS BASELINE	112	118	141	191	289	451	592	370	330	310	312	312	314
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	14.4	48.0	103.4	133.4	104.0	168.1	129.9	114.3	113.9	113.7	112.1
ALTERNATIVE 3													
N-4	0	0	4	19	10	20	30	11	0	0	0	0	0
7-9	0	0	3	11	10	11	16	4	0	0	0	0	0
10-12	0	0	3	11	10	11	17	4	0	0	0	0	0
TOTAL N-1 RELATED	0	0	10	40	30	42	63	19	0	0	0	0	0
N-1 PLUS BASELINE	112	118	133	171	169	177	190	165	142	143	147	147	149
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	9.7	32.9	28.6	30.3	44.9	16.2	0.7	0.7	0.7	0.7	0.7
ALTERNATIVE 4													
N-4	0	0	4	20	10	20	30	11	0	0	0	0	0
7-9	0	0	3	11	10	11	16	4	0	0	0	0	0
10-12	0	0	3	11	10	11	17	4	0	0	0	0	0
TOTAL N-1 RELATED	0	0	10	42	30	42	63	19	0	0	0	0	0
N-1 PLUS BASELINE	112	118	135	171	169	177	190	165	142	143	147	147	149
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	9.7	32.9	28.6	30.3	44.9	16.2	0.7	0.7	0.7	0.7	0.7

SOURCE: IBM SCIENCES, 1-NOV-80

Table 2.1.8-3.

PROJECTED BASELINE AND M-1 RELATED HEALTH SERVICES AND HOSPITAL BED REQUIREMENTS, IN HILLARD
ADJUSTING TREND BASELINE

ALTERNATIVE / REQUIREMENTS	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE												
PHYSICIANS	14	13	13	16	17	17	17	10	18	10	18	10
REGISTERED NURSES	43	43	47	49	51	51	53	54	55	55	56	56
DENTISTS	8	8	8	8	8	8	8	8	8	8	8	8
MENTAL HEALTH PERSON	2	2	2	2	2	2	2	2	2	2	2	2
HOSPITAL BEDS	38	40	41	43	44	45	46	48	49	49	49	50
PROPOSED ACTION												
PHYSICIANS	0	0	0	2	2	4	1	0	0	0	0	0
REGISTERED NURSES	0	0	1	5	4	7	3	0	0	0	0	0
DENTISTS	0	0	0	0	0	0	0	0	0	0	0	0
MENTAL HEALTH PERSON	0	0	0	0	0	0	0	0	0	0	0	0
HOSPITAL BEDS	0	0	1	5	5	5	3	0	0	0	0	0
ALTERNATIVE 2												
PHYSICIANS	0	0	1	6	10	13	11	7	2	2	2	2
REGISTERED NURSES	0	0	4	14	30	44	34	21	7	7	7	7
DENTISTS	0	0	0	1	3	4	2	2	1	1	1	1
MENTAL HEALTH PERSON	0	0	0	0	1	2	2	1	0	0	0	0
HOSPITAL BEDS	0	0	4	14	24	37	27	18	8	8	8	8
ALTERNATIVE 3												
PHYSICIANS	0	0	0	2	2	4	1	0	0	0	0	0
REGISTERED NURSES	0	0	1	5	4	5	3	0	0	0	0	0
DENTISTS	0	0	0	0	0	0	0	0	0	0	0	0
MENTAL HEALTH PERSON	0	0	0	0	0	0	0	0	0	0	0	0
HOSPITAL BEDS	0	0	1	5	5	5	3	0	0	0	0	0
ALTERNATIVE 4												
PHYSICIANS	0	0	0	1	2	4	1	0	0	0	0	0
REGISTERED NURSES	0	0	1	5	4	5	3	0	0	0	0	0
DENTISTS	0	0	0	0	0	0	0	0	0	0	0	0
MENTAL HEALTH PERSON	0	0	0	0	0	0	0	0	0	0	0	0
HOSPITAL BEDS	0	0	1	5	5	5	3	0	0	0	0	0

SOURCE: IOWA SCIENCES, 1-NOV-80

baseline growth requirements by more than 80 percent and would put severe strain on the health care facilities although only temporarily.

Location of a base near Delta would have some spill-over population in Beaver and Juab counties in Utah but the effects in Beaver County would be negligible. The peak year demand in Juab county would be 10 additional health care personnel and 7 hospital beds. This would put some short term pressures on the local facilities.

This situation would be further escalated with the demand generated by projects other than M-X, such as the Intermountain Power Project. The cumulative demand during the peak year could be as high as 180 percent of the normal growth requirements of 77 health care personnel and 45 hospital beds. Even during the steady state, the cumulative requirements would be more than 40 percent above the normal growth requirements, requiring long-term mitigating measures to ameliorate the situation.

Public Safety

Tables 2.1.8-4 and 2.1.8-5 present the requirements for law enforcement and fire personnel in Millard County resulting from the M-X project. Millard County police and fire personnel requirements peak in 1988 under all alternatives but 8 which peak in 1986. The number of additional law enforcement personnel is expected in the peak year of Alternative 2 to be 208.7 percent above the number projected to be needed under normal growth conditions. This dramatic increase will place heavy burdens on the existing law enforcement system which is already understaffed and inadequate to meet the present community needs. Problems of crowded facilities, particularly jails and of attracting and keeping enough qualified people to serve as deputies and police officers will be critical ones.

M-X-related fire personnel requirements reach 121.1 percent over baseline in the peak year of Alternative 2. This sizable increase is likely to result in problems. The fire protection force in Millard County is composed of volunteers. With the influx of a large population the volunteer force may find it difficult to continue to provide fire protection, particularly for scattered mobile homes and large commercial buildings. Under the other alternatives (except 8) police requirements are 52.2 percent and fire 36.8 percent over baseline in the peak year.

Subsequent to peak year demands on public safety services the out-migration of construction workers will occur, resulting in a continuing decrease at the county level in total personnel requirements attributable to M-X deployment. Personnel requirements in Millard County stabilize and reach a steady state around 1991 for Alternative 1 and 1990 for the other alternatives (except 8). This is the level of impact which can be most usefully mitigated through long range planning. The aforementioned tables indicate the number of police and fire personnel that will be required in the long term and the percent over baseline requirements that they represent. No long term effects are anticipated under any of the alternatives but Alternative 2 under which long term requirements are still approximately double the projected baseline requirements for the period. In Millard County long term needs can possibly be accommodated with sufficient advance planning and funding, however the level of need will require substantial and permanent expansion of police and fire facilities and personnel.

Table 2.1.8-4.

PROJECTED BASELINE AND M-X RELATED REQUIREMENTS FOR LAW ENFORCEMENT PERSONNEL BY ALTERNATIVE, IN MILLION
ASSUMING TREND BASELINE

ALTERNATIVE / PERSONNEL REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	19	20	20	21	22	22	23	23	24	24	24	24	25
PHIPOSED ACTION													
M-X REQUIREMENTS	0	0	2	8	6	7	12	9	0	0	0	0	0
M-X PLUS BASELINE	19	20	22	29	28	29	35	20	24	24	24	24	25
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	9.6	36.6	26.8	30.6	51.4	21.0	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 2													
M-X REQUIREMENTS	0	0	3	12	26	40	48	44	32	27	27	27	27
M-X PLUS BASELINE	19	20	23	33	48	62	71	67	56	51	51	51	52
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	14.3	54.8	116.2	174.9	205.4	184.4	131.4	109.9	109.1	108.3	107.8
ALTERNATIVE 3													
M-X REQUIREMENTS	0	0	2	8	7	7	12	6	0	0	0	0	0
M-X PLUS BASELINE	19	20	22	29	29	29	35	29	24	24	24	24	25
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	9.6	36.6	31.3	30.6	51.4	25.1	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 6													
M-X REQUIREMENTS	0	0	2	8	7	7	12	6	0	0	0	0	0
M-X PLUS BASELINE	19	20	22	29	29	29	35	29	24	24	24	24	25
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	9.6	36.6	31.3	30.6	51.4	25.1	0.0	0.0	0.0	0.0	0.0

SOURCE: LAW SCIENCES, 1 NOV 80

Table 2.1.8-5.

PROJECTED BASELINE AND M X RELATED REQUIREMENTS FOR FIRE PROTECTION PERSONNEL BY ALTERNATIVE, IN HILLADU
ASSUMING TREND BASELINE

ALTERNATIVE / PERSONNEL REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	15	16	17	18	19	20	21	22	23	24	25	26	27
PROPOSED ACTION													
M X REQUIREMENTS	0	0	1	4	4	4	7	2	0	0	0	0	0
M X PLUS BASELINE	15	16	18	22	23	24	27	24	23	24	25	26	27
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	5.9	22.2	21.7	21.2	36.3	10.2	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 2													
M X REQUIREMENTS	0	0	2	8	19	22	23	18	11	7	7	7	7
M X PLUS BASELINE	15	16	19	26	33	40	42	37	31	27	27	27	27
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	11.6	44.3	81.2	116.6	119.3	91.4	94.7	34.5	34.3	34.0	33.9
ALTERNATIVE 3													
M X REQUIREMENTS	0	0	1	4	4	4	7	2	0	0	0	0	0
M X PLUS BASELINE	15	16	18	22	23	24	27	24	23	24	25	26	27
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	5.9	22.2	21.7	21.2	36.3	10.2	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 6													
M X REQUIREMENTS	0	0	1	4	4	4	7	2	0	0	0	0	0
M X PLUS BASELINE	15	16	18	22	23	24	27	24	23	24	25	26	27
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	5.9	22.2	21.7	21.2	36.3	10.2	0.0	0.0	0.0	0.0	0.0

GENERIC FIRE SCIENCE, 1 NOV 80

Parks and Recreation

M-X induced population in-migration to the Delta area will create an increase demand for both urban and regional parks and recreational facilities in Millard County. This increase in demand could stress existing urban facilities. At present, approximately 12 additional acres of parks are needed. Nearby Fish Lake National Forest can satisfy some of the increased demand for regional recreational facilities. However, to meet the increased recreation planning capabilities needs, funds and land will be required. The land requirements for the expansion of local recreational facilities in Millard County are presented in Table 2.1.8-6.

The projected population growth due to M-X would increase the peak year land requirements for recreation and parks by 90 acres and long term requirements by 23 acres in Millard County if Delta is chosen as the site for the second base. Additional rural acreage may be required for such recreational pursuits as off-road vehicular activity in order to spare habitats of rare and endangered species of plants and wildlife. The U. S. Forest Service could open more lands for informal outdoor activities such as hunting, fishing and camping. Also, through subdivision and Planned Unit Development ordinances a community can require certain amounts of recreation or open space in housing and mobile home development.

Solid Waste Disposal

M-X-induced in-migration to the Delta area will create additional quantities of solid wastes not only in residences but also in the additional business and governmental activities required to support this population increment in Millard County.

The population corresponding to the trend baseline growth will, by 1993, exhaust the 35 acres currently available near Delta for solid waste disposal. If Delta is chosen as the site for the second base, the M-X induced population demands for solid-waste disposal land area will begin in 1984. About 23 acres of landfill areas will provide for all major-project induced solid wastes through 2009, that is over the 20-year operational life of the M-X system.

The effect of M-X OB sites on Millard County land requirements for solid waste disposal are illustrated in Table 2.1.8-7.

EFFECTS ON QUALITY OF LIFE (2.1.9)

The impact projections are conditional in that they are contingent on the actions taken by policy makers and also on the basic assumptions concerning factors such as the levels and pace of development which will occur. Moreover, the components of quality of life are numerous and complex and there is a great deal of uncertainty as to the probable outcomes since the basic models are lacking. Individual preference functions are unknown and community preference functions are hard to ascertain. Nevertheless, an attempt has been made to provide comparisons, within the framework of certain assumptions, suggestive of the trend of growth impacts on the communities in question.

The rapid population growth that can be anticipated if an operating base is located in the vicinity of Delta will result in many objective and subjective changes in the quality of life in the surrounding communities. Figure 2.1.9-1 shows potential

Table 2.1.8-6.

PROJECTED MAX RELATED LAND REQUIREMENTS FOR PARKS AND PLAYGROUNDS, BY ALTERNATIVE, IN MILLARD
ASSUMING TREND BASELINE

ALTERNATIVE / LAND REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
PROPOSED ACTION													
PLAYGROUNDS	0	0	1	3	3	3	4	2	0	0	0	0	0
NEIGHBORHOOD PARKS	0	0	1	4	3	4	6	3	0	0	0	0	0
COMMUNITY PARKS	0	0	3	11	10	11	17	7	0	0	0	0	0
TOTAL	0	0	5	18	16	10	27	11	0	0	0	0	0
ALTERNATIVE 2													
PLAYGROUNDS	0	0	2	5	9	13	14	13	7	4	4	4	4
NEIGHBORHOOD PARKS	0	0	2	7	12	17	19	14	9	6	6	6	6
COMMUNITY PARKS	0	0	6	20	37	53	57	44	28	18	10	18	18
TOTAL	0	0	10	32	58	83	90	69	44	28	20	28	28
ALTERNATIVE 3													
PLAYGROUNDS	0	0	1	3	3	3	4	2	0	0	0	0	0
NEIGHBORHOOD PARKS	0	0	1	4	3	4	6	3	0	0	0	0	0
COMMUNITY PARKS	0	0	3	12	10	12	17	7	0	0	0	0	0
TOTAL	0	0	5	19	16	19	27	11	0	0	0	0	0
ALTERNATIVE 4													
PLAYGROUNDS	0	0	1	3	3	3	4	2	0	0	0	0	0
NEIGHBORHOOD PARKS	0	0	1	4	3	4	6	3	0	0	0	0	0
COMMUNITY PARKS	0	0	3	12	10	12	17	7	0	0	0	0	0
TOTAL	0	0	5	19	16	19	27	11	0	0	0	0	0

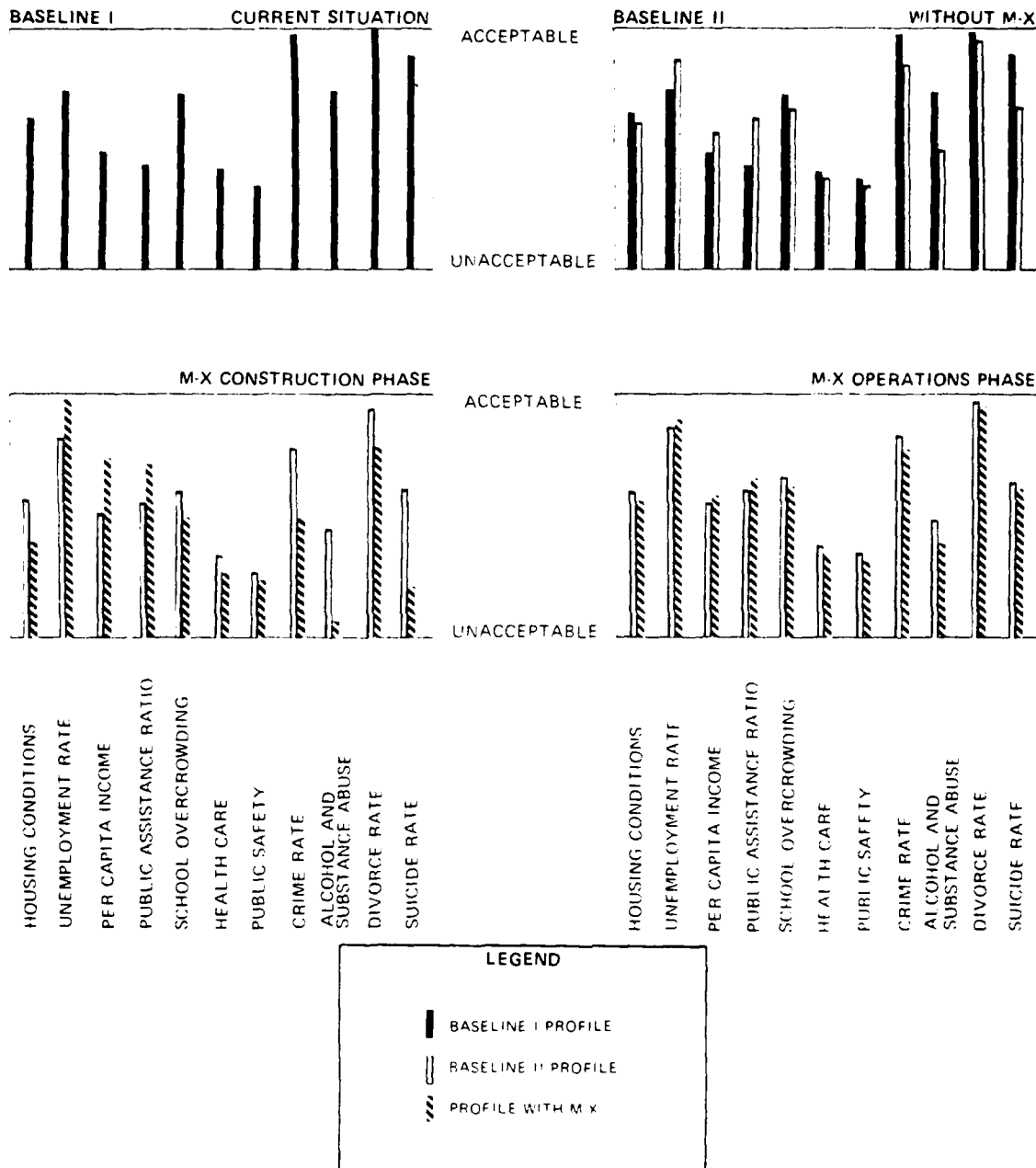
SOURCE: MRD SCENARIOS, 1 NOV 80

Table 2.1.8-7.

PROJECTED BASELINE AND M-X RELATED LAND REQUIREMENTS (ACRES) FOR SOLID WASTE DISPOSAL, BY ALTERNATIVE, IN MILLARD
ASSUMING TREND BASELINE

ALTERNATIVE / LAND REQUIREMENTS	1987	1993	1998	2004	2009	2014	2017	2021	2025	2030	2035	2040	2045	2050
BASELINE REQUIREMENTS	1.4	1.7	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.9
IMPOSED ACTION														
M-X REQUIREMENTS	0.0	0.0	0.1	0.4	0.4	0.4	0.4	0.6	0.2	0.0	0.0	0.0	0.0	0.0
M-X PLUS BASELINE	1.4	1.7	1.7	2.0	2.1	2.1	2.1	2.4	2.0	1.8	1.8	1.8	1.8	1.9
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	6.4	24.4	23.8	23.3	24.2	34.2	11.2	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 2														
M-X REQUIREMENTS	0.0	0.0	0.2	0.0	1.4	2.0	2.2	1.7	1.7	1.0	0.7	0.7	0.7	0.7
M-X PLUS BASELINE	1.4	1.7	1.8	2.4	3.1	3.7	4.0	3.5	3.5	2.8	2.5	2.6	2.6	2.6
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	12.7	48.8	83.4	116.6	125.5	25.0	25.0	54.7	30.0	37.7	37.4	37.2
ALTERNATIVE 3														
M-X REQUIREMENTS	0.0	0.0	0.1	0.4	0.4	0.4	0.4	0.6	0.3	0.0	0.0	0.0	0.0	0.0
M-X PLUS BASELINE	1.4	1.7	1.7	2.0	2.1	2.1	2.4	2.4	2.1	1.8	1.8	1.8	1.8	1.9
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	6.4	24.4	23.8	23.3	24.2	34.2	16.0	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 6														
M-X REQUIREMENTS	0.0	0.0	0.1	0.4	0.4	0.4	0.4	0.6	0.3	0.0	0.0	0.0	0.0	0.0
M-X PLUS BASELINE	1.4	1.7	1.7	2.0	2.1	2.1	2.4	2.4	2.1	1.8	1.8	1.8	1.8	1.9
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	6.4	24.4	23.8	23.3	24.2	34.2	16.0	0.0	0.0	0.0	0.0	0.0

SOURCE: ENVIRONMENTAL SCIENCE, 4 NEW RD



2492-A

Figure 2.1.9-1. Potential changes in the quality of life profiles of Millard County, Utah.

changes in the quality of life that might reasonably be expected. The histograms portray an assessment of the impact on the quality of life, as measured by a particular index in a range from acceptable to unacceptable. The four segments of the figure depict: (a) Baseline I, which simply portrays the county's particular index value as a proportion of the corresponding state index value (where acceptable denotes a value that is 50 percent better than the state figure, and unacceptable represents a value that is 100 percent worse than the state figure), for eleven quality of life indices; (b) Baseline II, the anticipated changes in these indices without M-X deployment in the county, but with the presence of other known projects; (c) anticipated changes during the M-X construction phase compared to Baseline II and, (d) anticipated changes during the M-X operations phase over Baseline II. Changes in the indices are assumed to be related to the rapidity of population growth. Since the quality of life literature points to a rapid deterioration of social organization with boomtown growth, it is assumed that such indices as crime, alcohol and substance abuse, divorce and suicide rates, may increase as much as four times the compound annual population growth rate. The economic well-being indices, e.g., per capita income, the unemployment rate, and the public assistance ratio (the proportion of the population on public assistance of some kind), on the other hand, are assumed to change at only double the annual compound population change rate. The remaining indices, housing conditions (a measure of overcrowding), school overcrowding (the ratio of pupils to teachers), health care (doctors, dentists, and registered nurses per 1,000 population, the number of hospital beds per 1,000 population), and public safety (ratio of police officers to population), collectively referred to as the community service indices, are all assumed to change inversely and linearly with the compound annual rate of population change.

Quality of Life Changes Without M-X

It is anticipated that Millard County will grow at a 9.7 percent compound annual growth rate between 1982 and 1987 due to the existence of a number of other projects, namely the Intermountain Power Project, the Continental Lime Plant, Modular Home Manufacturing, and the Martin Marietta Cement Plant. This rate of growth is likely to substantially alter the present quality of life in Millard County. Housing, health care services and public safety, already below Utah average standards, particularly the latter two, are likely to be taxed, as is the case for school overcrowding, which was slightly better off than the state average to begin with (Figure 2.1.9-1, upper right quadrant, which shows the Baseline II profile over Baseline I). Social organization can be expected to be disrupted with some rise in crime, alcohol, and substance abuse, divorce and even suicide rates. However, since Millard County's baseline situation is much better than the state average on two of these particular quality of life indices, the crime and divorce rates, even a fairly large increase in social disorganization will still leave the county better off than the Utah average. With the exception of the unemployment rate, the economic well being indices lag so far behind the state that even a 9.7 percent growth rate is not going to appreciably alter this fact (Figure 2.1.9-1, upper right quadrant).

Quality of Life During the M-X Construction Phase

Assuming that an operating base is located near Delta, a peak cumulative influx of 24,000 additional people is expected during the construction phase, resulting in a peak cumulative population change of 130 percent over Baseline II in 1988. Up to this peak year, population will be growing at a 23.5 percent compound

changes in the quality of life that might reasonably be expected. The histograms portray an assessment of the impact on the quality of life, as measured by a particular index in a range from acceptable to unacceptable. The four segments of the figure depict: (a) Baseline I, which simply portrays the county's particular index value as a proportion of the corresponding state index value (where acceptable denotes a value that is 50 percent better than the state figure, and unacceptable represents a value that is 100 percent worse than the state figure), for eleven quality of life indices; (b) Baseline II, the anticipated changes in these indices without M-X deployment in the county, but with the presence of other known projects; (c) anticipated changes during the M-X construction phase compared to Baseline II and, (d) anticipated changes during the M-X operations phase over Baseline II. Changes in the indices are assumed to be related to the rapidity of population growth. Since the quality of life literature points to a rapid deterioration of social organization with boomtown growth, it is assumed that such indices as crime, alcohol and substance abuse, divorce and suicide rates, may increase as much as four times the average annual population growth rate. The economic well-being indices, e.g., per capita income, the unemployment rate, and the public assistance ratio (the proportion of the population on public assistance of some kind), on the other hand, are assumed to change at only double the annual average population change rate. The remaining indices, housing conditions (a measure of overcrowding), school overcrowding (the ratio of pupils to teachers), health care (doctors, dentists, and registered nurses per 1,000 population, the number of hospital beds per 1,000 population), and public safety (ratio of police officers to population), collectively referred to as the community service indices, are all assumed to change inversely and linearly with the compound annual rate of population change.

Quality of Life Changes Without M-X

It is anticipated that Millard County will grow at a 9.7 percent compound annual growth rate between 1982 and 1987 due to the existence of a number of other projects, namely the Intermountain Power Project, the Continental Line Plant, Modular Home Manufacturing, and the Martin Marietta Cement Plant. This rate of growth is likely to substantially alter the present quality of life in Millard County. Housing, health care services and public safety, already below Utah average standards, particularly the latter two, are likely to be taxed, as is the case for school overcrowding, which was slightly better off than the state average to begin with (Figure 2.1.9-1, upper right quadrant, which shows the Baseline II profile over Baseline I). Social organization can be expected to be disrupted with some rise in crime, alcohol, and substance abuse, divorce and even suicide rates. However, since Millard County's baseline situation is much better than the state average on two of these particular quality of life indices, the crime and divorce rates, even a fairly large increase in social disorganization will still leave the county better off than the Utah average. With the exception of the unemployment rate, the economic well being indices lag so far behind the state that even a 9.7 percent growth rate is not going to appreciably alter this fact (Figure 2.1.9-1, upper right quadrant).

Quality of Life During the M-X Construction Phase

Assuming that an operating base is located near Delta, a peak cumulative influx of 24,000 additional people is expected during the construction phase, resulting in a peak cumulative population change of 130 percent over Baseline II in 1988. Up to this peak year, population will be growing at a 23.5 percent compound

base and associated population increase is projected to be 37 MW. Since this is a substantial increase over the present capacity of 6 MW, new transmission and distribution facilities would be required. See the Power and Energy Technical Report for detailed information.

Mitigations

Careful siting, taking into account the environmental restrictions and concerns, can mitigate the potential impacts of both fuel and power facilities. Coordination with the utility companies can assure minimum impact on current electrical power and fuel users and assure that the M-X system becomes operational as planned. Similarly, impacts on fuel availability can be mitigated by timely adjustment of allocations. Alternate energy system development and energy conserving construction will reduce external energy demands.

EFFECTS ON ENERGY (2.1.10)

Construction and operation of the M-X defense system in the vicinity of Delta will require substantial improvements in energy transportation capabilities. Development of the required energy handling facilities must be in concert with M-X system construction.

Delta is located in an area that has no natural gas service. Although no plans exist for extension of service to the area, if such service were to be provided the supplier would be Mountain Fuel Supply (MFS), Salt Lake City. Pacific Gas Transmission (PGT), a subsidiary of Pacific Gas and Electric, San Francisco, has proposed to build a 30-in., high-pressure gas transmission line from Kemmerer, Wyoming and Bonanza, Utah, joining east of Provo, Utah near Strawberry Reservoir, and continuing along Interstate 15 through Cedar City, Utah and Las Vegas, Nevada to Southern California. Delta is located approximately 26 mi west of the proposed pipeline route.

Electrical energy to Delta is supplied by Utah Power and Light Company via two 46-KV subtransmission lines. The increase in electrical load due to an operating base and associated population increase is projected to be 37 MW. Since this is a substantial increase over the present capacity of 6 MW, new transmission and distribution facilities would be required. See the Power and Energy Technical Report for detailed information.

Mitigations

Careful siting, taking into account the environmental restrictions and concerns, can mitigate the potential impacts of both fuel and power facilities. Coordination with the utility companies can assure minimum impact on current electrical power and fuel users and assure that the M-X system becomes operational as planned. Similarly, impacts on fuel availability can be mitigated by timely adjustment of allocations. Alternate energy system development and energy conserving construction will reduce external energy demands.

EFFECTS ON TRANSPORTATION (2.1.11)

The population increases associated with construction and operation of an operating base near Delta would have a significant impact on traffic in the surrounding area.

The portion of U.S. 6-50 between the proposed operating base site and Delta would receive the greatest amount of traffic growth due to the project. The anticipated 10,000 vehicles per day, including up to 2,000 commuters will exceed the capacity of the existing road. Figure 2.1.11-1 presents the anticipated 1992 traffic. That section of highway will have to be widened to four lanes to accommodate the anticipated traffic without severe congestion. Staggered work shifts and substantial use of buses and carpools could reduce the volume of traffic and possibly obviate the need to widen the road. However, spot improvements would probably still be needed at intersections near the base and within the communities of Hinckley and Delta to adequately handle the traffic. The roads between Delta and the communities of Fillmore, Holden and Nephi would all have increased traffic but major improvements would not be required.

The anticipated in-migration of around 1,500 new households into Millard County would generate approximately 15,000 trips or traffic movements, on an average day. Most of these, probably around 75 percent, would probably originate in the immediate vicinity of Delta and Hinckley. Major additions to the street system as well as modifications and improvements to the existing streets will be required. The other nearby communities would also be affected but to a lesser degree. The extent of the impacts would depend upon the specific growth patterns and the number of persons that choose to live within each community. Localized traffic problems may result at some locations, however, and improvements or modifications may be required at specific points.

EFFECTS ON NATIVE AMERICANS (2.1.12)

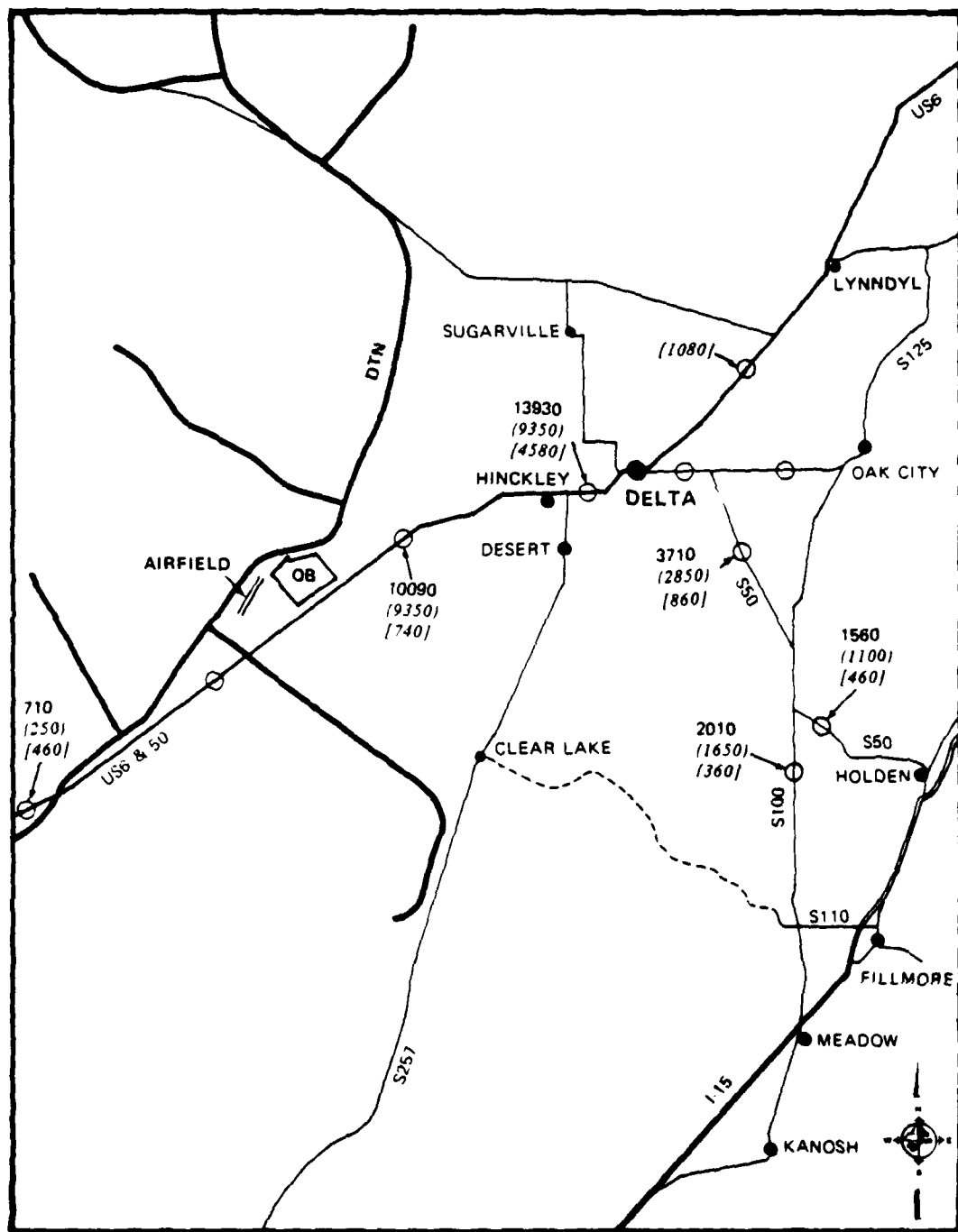
Potential direct and indirect impacts on Native American ancestral/sacred sites are discussed in Section 2.1.13. Nothing is currently known about possible uses of the OB siting area by contemporary Indians for hunting, gathering, or other traditional activities. Southern Paiutes at the Kanosh Reservation, some 50 mi southeast of the proposed OB, have expressed concern for the preservation of ancestral habitation sites, ceremonial sites, burial areas, and native floral and faunal resources in the vicinity of the reservation, and in the adjacent Pahvant Range (U.S. Forest Service, 1974; Facilitators, Inc., 1980). Further research is needed to determine the extent of potential indirect impacts to such cultural resources in the Fishlake National Forest due to increased recreational demand and activity.

Construction of an operating base at Delta would not directly impact any Native American land or water resources. It is unlikely, albeit possible, that conflict between M-X and Utah Southern Paiute land withdrawals could occur. Up to 15,000 acres of land will be withdrawn from among federal, state and private lands in any of five Utah counties to provide reservations for the Utah Southern Paiute Bands recently reinstated to federal trusteeship.

The prepared OB at Delta is about 50 mi northwest of the Native American Colony at Kanosh. Job opportunities at Delta are expected to stimulate the in-migration to Kanosh of friends and relatives of Kanosh members.

EFFECTS ON ARCHAEOLOGICAL AND HISTORICAL RESOURCES (2.1.13)

Direct impacts to archaeological and historical sites cannot be fully assessed at this time due to the lack of systematic survey at the proposed base location and



LEGEND 000 - TOTAL 1992 TRAFFIC
 (000) - MX TRAFFIC
 /000/ - 1992 TRAFFIC WITHOUT MX

SCHEMATIC NOT TO SCALE

2195-A-1

Figure 2.1.11-1. Projected traffic volumes in the vicinity of Delta, assuming second operating base.

in the suitability zone. However, the locations of 73 recorded sites in the Delta vicinity suggest that the Beaver and Sevier River drainages and their tributaries are the most sensitive areas in the region. In contrast to most other Great Basin valleys, nearly 90 percent of the recorded archaeological and historical sites are located in lower bajada/valley floor settings. In the region within a 20 mi radius of the Delta OB, approximately 25 percent of the area is considered to be of potential moderate to high sensitivity. In addition, four National Register properties occur in the immediate vicinity of the Delta OB. These include Fort Deseret, the Gunnison Massacre Site, the Topaz War Relocation Camp, and the Paleo-Indian Site, 42 MD 300. Prehistoric habitation sites, historic properties, rock art sites, and sites representing more limited activity are numerous in the general vicinity.

As depicted, the various OB facilities appear to directly impact about 10 mi² of moderate to low sensitivity area. Siting of proposed OB facilities is preferable in unwatered bajada areas placed as distantly as possible from the Sevier and Beaver Rivers. It is not recommended at this time that the OB facilities be moved. However, the railroad spur addition, as shown, directly impacts the National Register Paleo-Indian site, 42 MD 300. It is highly probable that other significant cultural resources could be impacted by this railroad spur where it crosses near the confluence of the Beaver and Sevier Rivers. To avoid these significant impacts, it is recommended that the railroad spur be moved to the north to follow the Hwy 6-50 right-of-way to the OB.

Indirect impacts are expected to result from an M-X induced population growth of about 24,000 in 1988 which represents a 205 percent increase over projected growth for that year. In addition, the on-base population will reach 9,600 by 1989. This growth coupled with much increased access to once-remote areas from construction of the M-X road network will cause greater and more extensive impacts to cultural resources than construction of the OB itself. Those valleys subject to high indirect impacts from increased population, accessibility, and site sensitivity due to development of the Delta OB are summarized in Chapter 2.

Growth related impacts in nearby communities potentially include neglect and decline of architecturally and historically significant properties, incongruous new construction disruptive of the community's architectural integrity, and demolition of significant structures for new construction. Effects of this nature are likely to be substantial in Delta, Hinckley, Deseret, Oak City, Lynndyl, and smaller communities to the east. Reduced population incursion, restricted access to sensitive areas, protective measures, community planning, and increased public education are measures which can serve to reduce these effects.

Because direct and indirect impacts to National Register and eligible properties are anticipated, a Programmatic Memorandum of Agreement has been developed between the Advisory Council on Historic Preservation, the Air Force, and other concerned agencies. This PMOA outlines a program which, if implemented, will avoid or satisfactorily mitigate adverse effects on historic and cultural properties.

Paleontology

The disturbance of the Bonneville sediments through excavation may destroy fossils contained in the sediment. Sites proposed for excavation can be examined to determine the potential for fossil material.

2.2 NATURAL ENVIRONMENT

EFFECTS ON VEGETATION (2.2.1)

Vegetation

The Delta site would be used for the second operating base in Alternative 2. A general discussion of impacts to native vegetation that would result from use of the Delta site is given in Chapter 4 in the DEIS, in the section on native vegetation.

A potentially serious impact not discussed in detail in Chapter 2 in the DEIS is the invasion of disturbed rangelands by the toxic weed halogeton (Halogeton glomeratus) (Young et al., 1975). A discussion may be found in ETR-14.

EFFECTS ON WILDLIFE (2.2.2)

Local pronghorn antelope populations may be adversely affected by utilization of this site. Reduction in habitat would result from construction and the presence of people, buildings, roads, equipment, and fences. Outdoor recreational activities could cause pronghorn to avoid additional portions of their range, including key habitat in the Desert Mountain area 25 mi (40 km) north of Delta. Increased poaching resulting from an estimated 110 percent increase in population may also impact pronghorn populations in the area. The pronghorn is a regionally significant biological resource with a high probability of being significantly impacted. A detailed impact analysis was conducted on this species, with the results presented in Chapter 2.

Increased recreation activity in the Drum and Little Drum mountains to the north, House Range to the west, and the Cricket Mountains to the south of the Delta OB site would adversely affect mule deer. There probably would be greater demand for hunting in these mountains since they are relatively close to this operating base site.

Waterfowl in Clear Lake and Topaz state waterfowl management areas and those at Fish Springs National Wildlife Refuge might receive greater hunting pressure. But since these areas are either state or federal management areas, hunting could be controlled and would not lead to any serious impacts to waterfowl.

EFFECTS ON AQUATIC SPECIES (2.2.3)

Although many game fish habitats are found east of Delta on the Sevier River and its tributaries, only two game fish habitats are within 25 mi of the proposed OB west of Delta. Gunnison Bend Reservoir and portions of the Sevier River provide warm-water game fisheries. No direct physical modification of game fish habitats would be expected from the construction of the proposed OB and related project features. Growth in Delta would further decrease water quality of both habitats by non-point source pollution from oils, solvents, pesticides, domestic pet excrement and other urban liquid and solid wastes. Expansion of the urban area would also result in an increase in recreational pressure including fishing, boating and other water-related activities.

EFFECTS ON PROTECTED SPECIES (2.2.4)

Protected Terrestrial Species

No protected terrestrial animals occur near the Delta suitability envelope. Thirteen sightings of bald eagles, the closest of which was approximately 8 mi from Delta, were recorded in 1979 in the area from McCormick, Utah, to Fillmore, Utah; no roost sites have been recorded in this area. Bald eagles are not expected to be impacted by construction of buildings around Delta. Peregrine falcons may nest in nearby mountains, but these mountains do not appear to be particularly attractive to recreationists, consequently few to no peregrine/human encounters are expected.

Protected Aquatic Species

No protected or recommended protected aquatic species occur near Delta. The closest protected aquatic species habitats are springs in White and Fish Springs Valleys to the west and northwest of the hydrologic subunit containing the potential OB site. Two known springs in White Valley and at least three known locations in Fish Springs Valley provide habitat for the state protected least chub. The nearest least chub site is about 30 mi west of the OB location, and is not expected to be attractive to recreational users. Several populations of the recommended-protected Bonneville cutthroat trout, which is the same fish as the Nevada state protected Utah cutthroat trout, occur in a few mountain streams bordering to the west of Snake Valley. Moderate fishing pressure on these habitats would be likely from personnel at the Delta OB. A detailed impact discussion of alternatives involving this OB and potential mitigations are presented in Chapter 2 and the technical report on Protected Species (ETR 17).

Protected Rare Plants

One (possibly two) known location of the terrace buckwheat (Eriogonum natum) occurs within the suitability zone of the Delta operating base (Figure 2.2.4-1). Construction of the operating base facilities in the area where this species is found may cause alteration of the habitat and may result in decreased abundance of the species. The plant is a recommended threatened species (Welsh, 1979). Four of the five known locations may be affected by project features. Expansion of the town of Delta is not anticipated to cause direct impacts to rare species.

Indirect effects occurring as a result of a large population increase (142 percent in Millard County) may cause some impact to rare species. These impacts would be due to increased ORV use and increased recreational activity in surrounding natural areas.

EFFECTS ON WILDERNESS AND SIGNIFICANT NATURAL AREAS (2.2.5)

OB impacts to wilderness are treated in Chapter 2 and in ETR-18. Discussion here is limited to significant natural areas. Figure 2.2.5-1 shows the operating base location for Delta. There is no direct overlap of the base suitability area with local significant natural areas.

Impacts to key natural areas as a result of siting a base at Delta would be related to the recreational activities of base personnel. Using the indirect effects analysis, areas likely to receive increased recreational visitation would include Lehman Caves, Fumarole Butte, Topaz and Clear Lake Wildlife Management Area as well as the natural landmark, Antelope Springs Trilobite Beds.

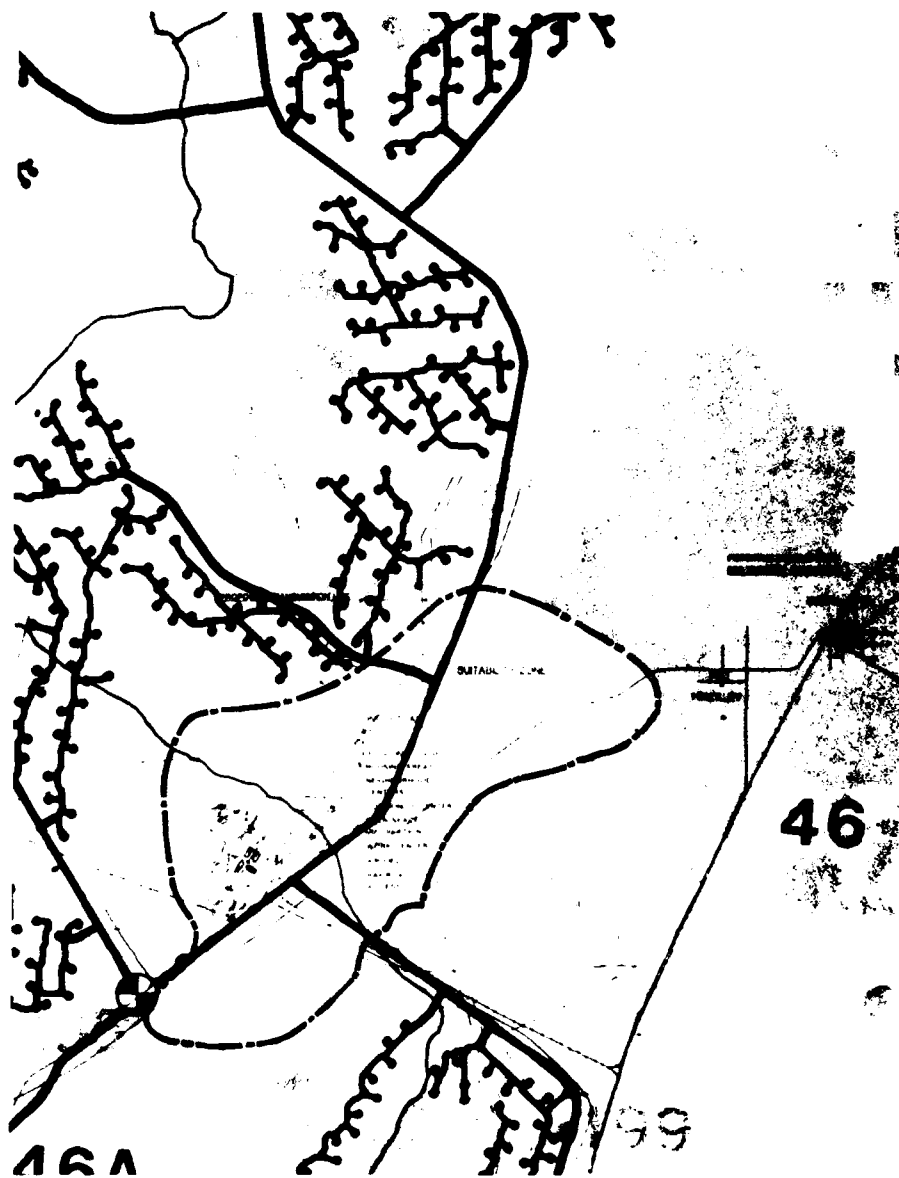


Figure 2.2.4-1. Delta suitability envelope vs. rare plants. (Page 1 of 2)

RARE PLANTS LEGEND

NUMBER	SPECIES	NUMBER	SPECIES	NUMBER	SPECIES
1	<i>A. ...</i>	74	<i>D. asperella</i> var. <i>zinnii</i>	147	<i>Monticola leucophaea</i>
2	<i>A. ...</i>	75	<i>D. asterophora</i> var. <i>asterophora</i>	148	<i>Monticola ...</i>
3	<i>A. ...</i>	76	<i>D. crassifolia</i> var. <i>nevadensis</i>	149	<i>Monticola ...</i>
4	<i>A. ...</i>	77	<i>D. ...</i>	150	<i>Monticola ...</i>
5	<i>A. ...</i>	78	<i>D. ...</i>	151	<i>Opuntia ...</i>
6	<i>A. ...</i>	79	<i>D. ...</i>	152	<i>Opuntia ...</i>
7	<i>A. ...</i>	79a	<i>D. ...</i>	153	<i>Opuntia ...</i>
8	<i>A. ...</i>	80	<i>D. ...</i>	154	<i>Opuntia ...</i>
9	<i>A. ...</i>	81	<i>D. ...</i>	155	<i>Opuntia ...</i>
10	<i>A. ...</i>	82	<i>D. ...</i>	156	<i>Opuntia ...</i>
11	<i>A. ...</i>	83	<i>E. ...</i>	157	<i>Opuntia ...</i>
12	<i>A. ...</i>	84	<i>E. ...</i>	158	<i>Opuntia ...</i>
13	<i>A. ...</i>	85	<i>E. ...</i>	159	<i>Opuntia ...</i>
14	<i>A. ...</i>	86	<i>E. ...</i>	160	<i>Opuntia ...</i>
15	<i>A. ...</i>	87	<i>E. ...</i>	161	<i>Opuntia ...</i>
16	<i>A. ...</i>	88	<i>E. ...</i>	162	<i>Opuntia ...</i>
17	<i>A. ...</i>	89	<i>E. ...</i>	163	<i>Opuntia ...</i>
18	<i>A. ...</i>	90	<i>E. ...</i>	164	<i>Opuntia ...</i>
19	<i>A. ...</i>	91	<i>E. ...</i>	165	<i>Opuntia ...</i>
20	<i>A. ...</i>	92	<i>E. ...</i>	166	<i>Opuntia ...</i>
21	<i>A. ...</i>	93	<i>E. ...</i>	167	<i>Opuntia ...</i>
22	<i>A. ...</i>	94	<i>E. ...</i>	168	<i>Opuntia ...</i>
23	<i>A. ...</i>	95	<i>E. ...</i>	169	<i>Opuntia ...</i>
24	<i>A. ...</i>	95a	<i>E. ...</i>	170	<i>Opuntia ...</i>
25	<i>A. ...</i>	96	<i>E. ...</i>	171	<i>Opuntia ...</i>
26	<i>A. ...</i>	97	<i>E. ...</i>	172	<i>Opuntia ...</i>
27	<i>A. ...</i>	98	<i>E. ...</i>	173	<i>Opuntia ...</i>
28	<i>A. ...</i>	99	<i>E. ...</i>	173a	<i>Opuntia ...</i>
29	<i>A. ...</i>	100	<i>E. ...</i>	174	<i>Opuntia ...</i>
30	<i>A. ...</i>	101	<i>E. ...</i>	175	<i>Opuntia ...</i>
31	<i>A. ...</i>	102	<i>E. ...</i>	176	<i>Opuntia ...</i>
32	<i>A. ...</i>	103	<i>E. ...</i>	176a	<i>Opuntia ...</i>
33	<i>A. ...</i>	104	<i>E. ...</i>	177	<i>Opuntia ...</i>
34	<i>A. ...</i>	105	<i>E. ...</i>	178	<i>Opuntia ...</i>
35	<i>A. ...</i>	105a	<i>E. ...</i>	179	<i>Opuntia ...</i>
36	<i>A. ...</i>	106	<i>E. ...</i>	180	<i>Opuntia ...</i>
37	<i>A. ...</i>	107	<i>E. ...</i>	181	<i>Opuntia ...</i>
38	<i>A. ...</i>	108	<i>E. ...</i>	182	<i>Opuntia ...</i>
39	<i>A. ...</i>	109	<i>E. ...</i>	183	<i>Opuntia ...</i>
39a	<i>A. ...</i>	110	<i>E. ...</i>	184	<i>Opuntia ...</i>
40	<i>A. ...</i>	111	<i>E. ...</i>	185	<i>Opuntia ...</i>
41	<i>A. ...</i>	112	<i>E. ...</i>	186	<i>Opuntia ...</i>
42	<i>A. ...</i>	113	<i>E. ...</i>	187	<i>Opuntia ...</i>
43	<i>A. ...</i>	114	<i>E. ...</i>	188	<i>Opuntia ...</i>
44	<i>A. ...</i>	115	<i>E. ...</i>	189	<i>Opuntia ...</i>
45	<i>A. ...</i>	116	<i>E. ...</i>	190	<i>Opuntia ...</i>
46	<i>A. ...</i>	117	<i>E. ...</i>	191	<i>Opuntia ...</i>
47	<i>A. ...</i>	118	<i>E. ...</i>	192	<i>Opuntia ...</i>
48	<i>A. ...</i>	119	<i>E. ...</i>	193	<i>Opuntia ...</i>
49	<i>A. ...</i>	120	<i>E. ...</i>	194	<i>Opuntia ...</i>
50	<i>A. ...</i>	121	<i>E. ...</i>	195	<i>Opuntia ...</i>
51	<i>A. ...</i>	122	<i>E. ...</i>	196	<i>Opuntia ...</i>
52	<i>A. ...</i>	123	<i>E. ...</i>	197	<i>Opuntia ...</i>
53	<i>A. ...</i>	124	<i>E. ...</i>	198	<i>Opuntia ...</i>
54	<i>A. ...</i>	125	<i>E. ...</i>	199	<i>Opuntia ...</i>
55	<i>A. ...</i>	126	<i>E. ...</i>	200	<i>Opuntia ...</i>
56	<i>A. ...</i>	127	<i>E. ...</i>	201	<i>Opuntia ...</i>
57	<i>A. ...</i>	128	<i>E. ...</i>	202	<i>Opuntia ...</i>
58	<i>A. ...</i>	129	<i>E. ...</i>	203	<i>Opuntia ...</i>
59	<i>A. ...</i>	130	<i>E. ...</i>	204	<i>Opuntia ...</i>
60	<i>A. ...</i>	131	<i>E. ...</i>	205	<i>Opuntia ...</i>
61	<i>A. ...</i>	132	<i>E. ...</i>	206	<i>Opuntia ...</i>
62	<i>A. ...</i>	133	<i>E. ...</i>	207	<i>Opuntia ...</i>
63	<i>A. ...</i>	134	<i>E. ...</i>	207a	<i>Opuntia ...</i>
64	<i>A. ...</i>	135	<i>E. ...</i>	208	<i>Opuntia ...</i>
65	<i>A. ...</i>	136	<i>E. ...</i>	209	<i>Opuntia ...</i>
66	<i>A. ...</i>	137	<i>E. ...</i>	210	<i>Opuntia ...</i>
67	<i>A. ...</i>	138	<i>E. ...</i>	211	<i>Opuntia ...</i>
68	<i>A. ...</i>	139	<i>E. ...</i>	212	<i>Opuntia ...</i>
69	<i>A. ...</i>	140	<i>E. ...</i>	213	<i>Opuntia ...</i>
70	<i>A. ...</i>	141	<i>E. ...</i>	214	<i>Opuntia ...</i>
71	<i>A. ...</i>	142	<i>E. ...</i>	215	<i>Opuntia ...</i>
72	<i>A. ...</i>	143	<i>E. ...</i>	216	<i>Opuntia ...</i>
73	<i>A. ...</i>	144	<i>E. ...</i>	217	<i>Opuntia ...</i>
		145	<i>E. ...</i>	218	<i>Opuntia ...</i>
		146	<i>E. ...</i>	219	<i>Opuntia ...</i>
				220	<i>Opuntia ...</i>

Figure 2.2.4-1. Delta suitability envelope vs. rare plants.
(Page 2 of 2)

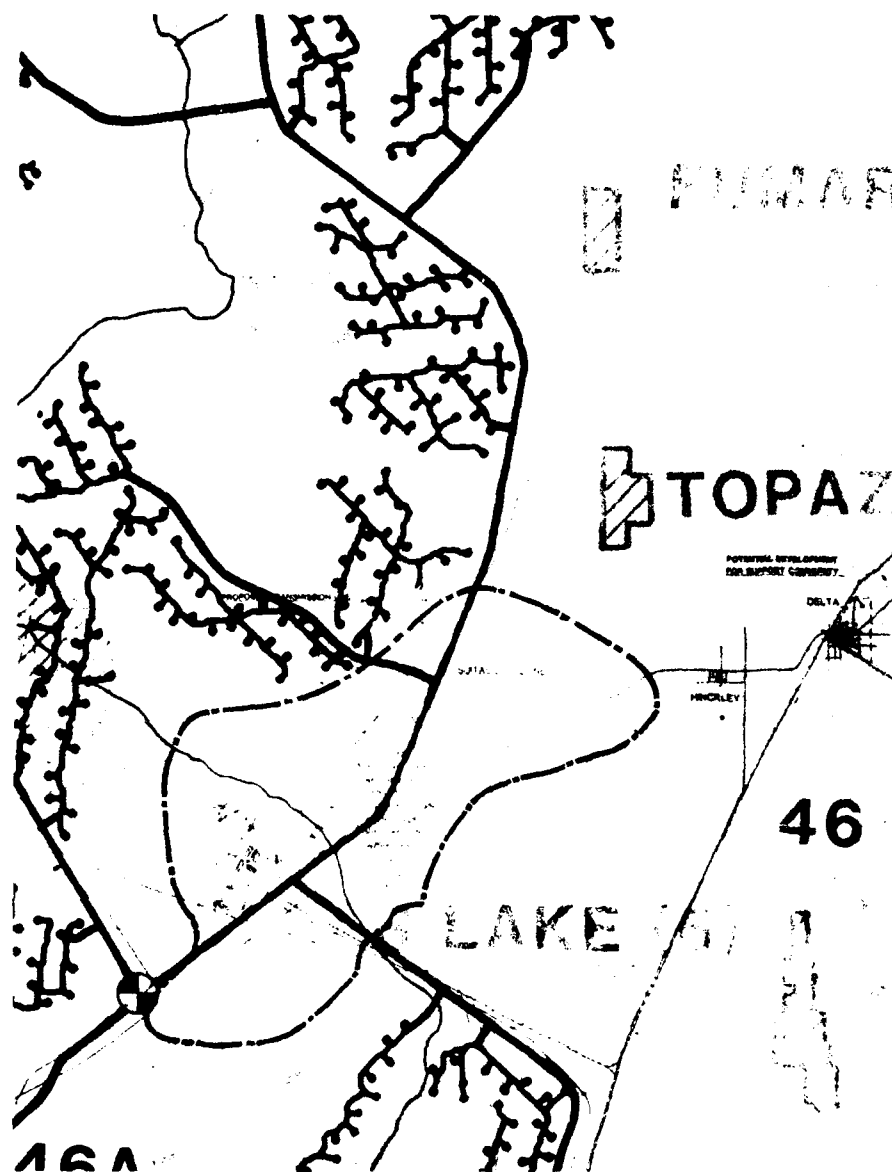


Figure 2.2.5-1. Delta suitability envelope vs. significant natural areas.

EFFECTS ON SURFACE WATERS (2.2.6)

Construction and maintenance of the operating base could have an impact on surface water due to increases in runoff and erosion. Storm runoff will be increased by the introduction of impermeable surfaces and channelization. Water quality may be affected by increased sediment streamloads due to construction. If surface rights are purchased, volumes may be locally reduced, but reduction of total surface water volume will be partially offset by return flow after treatment, especially during the maintenance phase.

Construction of an operating base near Delta will result in estimates of low short-term erosion impacts due to the limited runoff, level topography, and the present slight erosion hazard of most of the predominating soils of the area. Any potential for erosion can be mitigated through revegetation of the disturbed soils and proper engineering design. Long-term impacts are expected to be insignificant if mitigating measures are undertaken.

The construction of an operating base near Delta will use an estimated 1,800 to 3,400 acre-ft of water. Permanent operational water requirements are estimated to range from 2,600 to 3,500 acre-ft per year.

EFFECTS ON GROUNDWATER RESOURCES (2.2.7)

Under full deployment basing mode, an operating base II (OB II) might be located near Delta, Utah. The OB II would include an airfield, support facilities, clear zones, and a railroad spur. It would occupy approximately 4,000 acres.

This site lies within an area within an area which is designated a critical groundwater basin by the Utah State Engineer. The area's inhabitants are currently mining its groundwater resources. The estimated perennial yield of 23,000 acre-ft per year is, for example, much less than the estimated current usage rate of 50,000 acre-ft per year (Fugro, 1980). This groundwater mining is reducing the groundwater availability by removing water from storage and probably reducing the storage capacity by permanent dewatering (compaction) of some areas. As substantial amounts of water are removed from storage, water quality will also be degraded (Mower and Feltis, 1968). The Sevier River system flow could be reduced, although perhaps not a very significant impact.

Potential Impacts

Since irrigated agriculture uses about 90 percent of the current total water withdrawals M-X impacts would primarily be felt by agriculture (Fugro, 1980). Water table declines would cause increased pumping costs.

An M-X operating base at the Delta site would need 57,000 acre-ft per year for 30 years. This demand would increase the current aquifer depletion rate (current use above perennial yield amounts to 27,000 acre-ft per year) by 21 percent, a very significant impact.

When compared with other alternative sites in Nevada/Utah, relative potential for impacts at Delta appears moderately low due mostly to the large amount of water in storage. Significant impact potential exists, however, because the system is currently under stress and the addition of M-X demands would significantly increase that stress.

The majority of present water usage is for agriculture in the Delta-Hinckley area. M-X construction and operation water usage would represent about 1.4 percent of present water usage, and it would be anticipated that if the State Engineer granted appropriation rights in nonagricultural areas, additional water-level decline due to the M-X project would be small. Springs in this basin are located above the valley floor and do not appear to be part of the valley-fill aquifer system. Therefore the project should have no effect on their discharge rates. Increased surface runoff during major storms would be minimal. Local increases in sheet and stream channel erosion may occur. Construction activities could degrade surface-water quality during thunderstorms, but no significant impacts on ground-water quality is expected.

Mitigation Measures

Existing groundwater rights could be purchased or leased. Additional wells would be designed and located to avoid pumpage centers, and local users. A numerical simulation model would be used to evaluate this region's multi-aquifer system, and a monitoring network would be developed. The extraction program would be altered according to the data these provide. A local surface drainage system and erosion control structures would be constructed to safely convey the runoff to natural drainage. Temporary ponds would be constructed to reduce peak flows and to desilt the runoff to avoid downstream deposition. After completion of the M-X project, the water supply system may be made available for local use.

EFFECTS ON AIR QUALITY (2.2.8)

The air quality impact on the area around Delta from increased emissions at the operating base was evaluated using three air quality models: HIWAY and IMPACT for gaseous pollutants and PAL for construction-related dust.

The logic employed in the selection of a particular model and limitations of the model are addressed in ETR 13.

Construction

Figure 2.2.8-1 presents the PAL model results for two representative base construction area source sizes and two emission levels, unmitigated and mitigated. The mitigation case assumes application of enough dust control treatment to reduce fugitive dust by 50 percent. The effective distance to the affected population is taken as 15 mi. This modeling effort indicates that Delta will be affected by dust but due to the model limitations (see ETR 13) the predicted dust concentrations shown as exceeding NAAQS standards are only a rough approximation.

Operation

Modeling conditions of regional NO_x and CO pollutants for Beryl, Utah, were considered representative of those expected at Delta, Utah, at the level of this analysis. Therefore, site-specific modeling for Delta was not completed at the regional level. A discussion of the Beryl, Utah, regional CO and NO_x modeling results that are pertinent to Delta follows. For general operational emissions, the IMPACT model was run for two representative gaseous pollutants, CO and NO_x . The emission levels were scaled from data at Vandenberg AFB and redistributed to

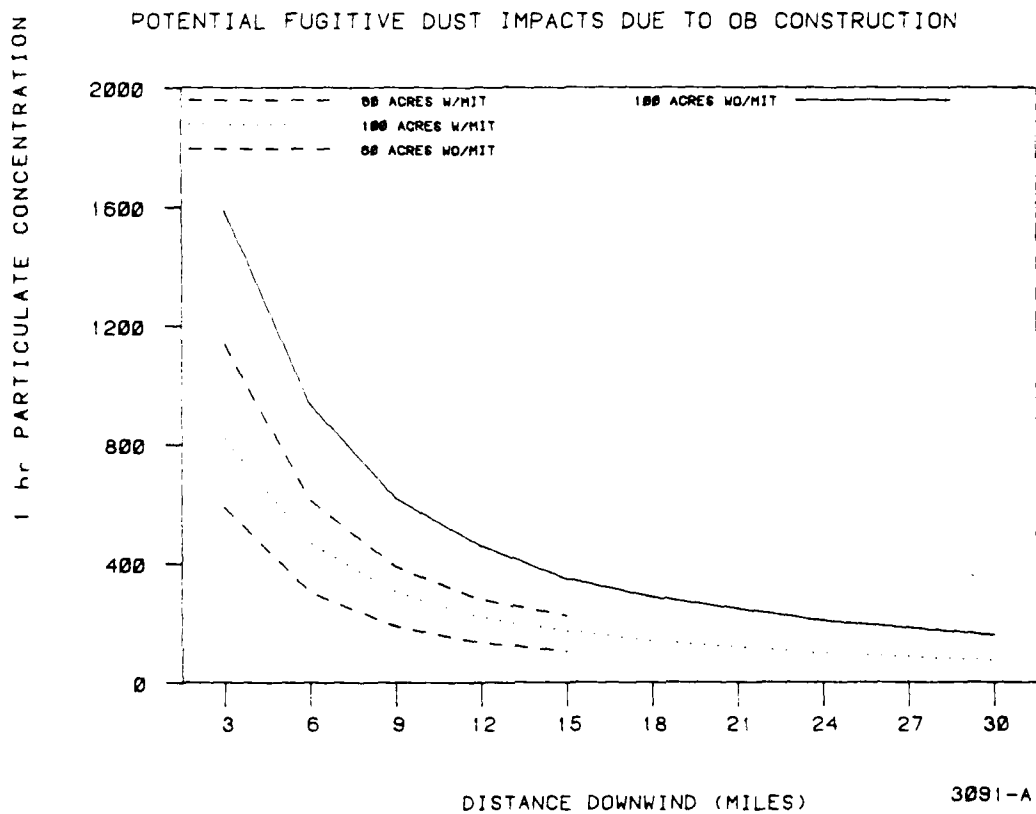


Figure 2.2.8.1. Potential fugitive dust impacts due to OB construction.

represent the expected operations base configuration. The results show that CO reached an hourly concentration of 2.3 parts per million (ppm) and NO_x reached an hourly concentration of 0.18 ppm. The CO values are well below both the federal and Utah standards and no significant adverse impacts are anticipated. The maximum one-hour NO_x concentration of 0.18 ppm, while greater in magnitude than the federal and Utah annual standards, is anticipated to be of extremely short duration and should not lead to any significant long-term impacts. The emissions of SO_x and HC are less in magnitude than those of NO_x or CO, so the predicted concentrations will also be smaller. Thus, no violations of the standards are expected for SO_x and HC.

The HIWAY model was used to examine the potential for local maxima of hydrocarbons, CO and NO_x associated with peak-hour traffic*. The results are shown in Table 2.2.8-1. The maximum predicted 1-hour CO concentration of 8.8 ppm is well below the federal or Utah standard of 35 ppm. As there is no 1-hour NO_x standard, a direct comparison of the modeling results with standards is not possible. However, the estimated values are not anticipated to be of long duration.

EFFECTS ON MINING AND GEOLOGY (2.2.9)

There are no mining sites in the vicinity of the proposed OB.

* The IMPACT modeling results are averaged over a grid which is 4,000 ft and do not represent possible local maxima.

Table 2.2.8-1. Delta, Utah, traffic-related concentrations¹:
1-hour averages in $\mu\text{g}/\text{m}^3$ (ppm) 50 m from
edge of roadway.

CLASSIFICATION	PEAK HOUR TRAFFIC ² VEHICLES/HR	CO	HC	NO _x
Baseline	80	430 (0.4)	54 (0.08)	74 (0.04)
Baseline Plus M-X Induced Traffic	1,190	10,070 (8.8)	1,589 (2.4)	1,691 (0.90)

3037-2

¹Worst-case meteorological conditions: 1 meter per second wind, 25 meter mixing height, wind parallel to roadway, very stable atmosphere.

²Peak-hour traffic is assumed to be 15 percent of the Average Daily Traffic (ADT).

U.S. GOVERNMENT PRINTING OFFICE: 1981-200-000-000

DATE
ILME